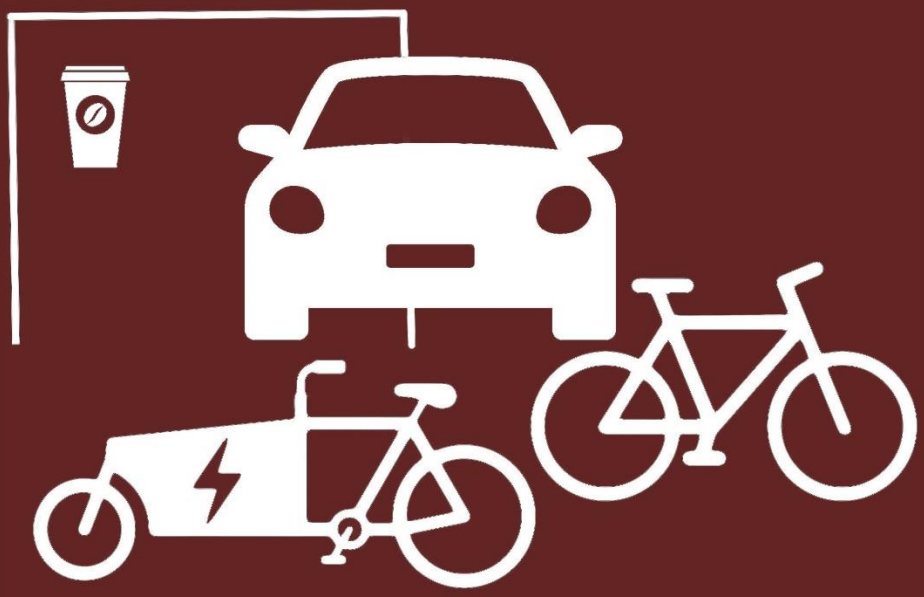
EXPLOITING THE BENEFITS OF A MOBILITY HUB TO INCENTIVIZE SHARED CAR USAGE

A QUALITATIVE RESEARCH STUDY



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EXPLOITING THE BENEFITS OF A MOBILITY HUB TO INCENTIVIZE SHARED CAR USAGE

A QUALITATIVE RESEARCH STUDY

By

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On behalf of the Delft University of Technology and in cooperation with AT Osborne

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PREFACE

This master thesis “To what extent could a mobility hub play a role in the adoption of shared cars located at the mobility hub?”, is the last piece to complete the master’s program of Construction Management and Engineering (CME) at the Delft University of Technology (TUD). This document represents the qualitative research study I have conducted in the last six months of my master’s program.

The thing I like most about this subject it that in daily life I was already wondering about the efficiency of the mobility system. For example, when strolling around in the city of Leiden I often wondered about solutions to deal with all those parked cars that take up the limited space that is left in dense city centres. This research study could actually contribute to designing a more efficient mobility system with mobility hubs and shared cars. Which hopefully eventually will replace the private owned cars and with that recover scarce space in Dutch cities.

I am glad about the enthusiasm regarding my research proposal by the lecturers at TU Delt and that AT Osborne has provided me with the opportunity to dive into this subject of mobility hubs and their influence on the adoption of shared cars. I have enjoyed this period and the research a lot and hope to continue with this subject in my future work to come.

Hoogenboom, J (Jim)

Leiden, Januari 2024

SUMMARY

This chapter presents a summary of the findings regarding a qualitative research study towards: “To what extent could a mobility hub play a role in the adoption of shared cars located at the mobility hub”?

CONTEXT

Dutch cities experience space scarcity due to the joint demand for space by housing, work locations, infrastructure, greenery, open water and energy transportation (Hamers et al., 2021). At the same time, cars take up unnecessary space because they are parked more than 90% of the time (KiM, 2018) and in addition they are a substantial contributor to the emission of greenhouse gasses (European Commission, n.d.). Therefore, to achieve the climate goals (i.e. reduce greenhouse gas emissions) and use the limited space in cities more efficiently plans exist that contain a transition of the conventional mobility system towards a more sustainable mobility system. This transition partly depends on the adoption of shared mobility (e.g. shared cars). For example, previous studies suggest that one shared car replaces between 9 and 13 private cars, saves up to 5 parking spaces and emits 175 to 265 kg less CO_2 (CROW, 2020). Therefore, incentivizing the use of shared cars could potentially aid in both the problems of space scarcity in dense cities and the redundancy of greenhouse gas emissions. In addition, at this moment and the years to come many Dutch cities and policy makers are looking to change the mobility system by developing mobility hubs. Implementing mobility hubs has the goal to use the limited available space more efficiently and simultaneously increase the liveability in the cities. The shared cars at a mobility hub play an important role in this because of their many benefits. Therefore, it is important to know how the adoption of these shared cars could be incentivized for potential users at a mobility hub.

PROBLEM DEFINITION & KNOWLEDGE GAP

Recent research studies have been focused on the adoption of shared cars and mobility hubs separately. Which is why there exists a knowledge gap regarding the influence of a mobility hub on the adoption of shared cars. The adoption of shared cars depends both on the aspects of a journey that are valued by travellers, and the features regarding a mode of transport that are valued by travellers. Therefore, the adoption of shared cars at a mobility hub will remain in a larger degree uncertain in case these aspects are not considered in the layout of a mobility hub. For example, the popularity of the private car could indicate which aspects of the journey (e.g. the flexibility) should be considered in the development of a mobility hub. However, it is unknown how the values of potential users could be considered in guidelines for the layout of a mobility hub. When these guidelines are known the mobility hub could be developed in such a way that the adoption of the shared cars located there becomes more likely.

RESEARCH OBJECTIVE & RESEARCH QUESTION

The objective of this qualitative research study is to reduce the knowledge gap by defining guidelines a mobility hub should fulfil in order to play a role in the adoption of shared cars located at the hub. By defining this role it becomes apparent to what extend a mobility hub could influence this adoption. This qualitative research study aims to fill the knowledge gap by answering the main research question:

To what extent could a mobility hub play a role in the adoption of shared cars located at the mobility hub?

Multiple angles had to be researched as unilateral answering the main research question was not possible. Therefore, a literature study provides insight in which aspects that are related to the use of a shared car could be influenced by a mobility hub (sub question 1). Next, expert interviews contribute to the knowledge regarding the mutual influences between mobility hubs and shared cars (sub question 2). Finally, a case study captures what stimulates residents to use a shared car at their nearby mobility hub (sub question 3).

METHODOLOGY

A qualitative research methodology answers the main research question, which exists of: a literature study to answer sub question 1, interviews with experts to answer sub question 2 and interviews with residents (i.e. the case study) to answer sub question 3. In each method the collected data was analysed with a Thematic Content Analysis (TCA). This made it possible to compare the results between the three methods. It is suggested that a theme is important when the number of times it reoccurs exceeds a threshold set in Paragraph 2.1.4, 2.2.5 or 2.3.3 (e.g. in case it is mentioned in 10% or more of the reviewed articles). The themes that exceed the threshold in all three TCAs are considered to be of primary importance regarding the adoption of shared cars. In addition, the themes that exceed the threshold in two of the TCAs are considered to be of secondary importance. Finally, the themes that only exceed a threshold in one of the TCAs are considered to be of tertiary importance.

To what extent could a mobility hub play a role in the adoption of shared cars located at the mobility hub?

Method		Description	Sub question
STEP 1 LITERATURE STUDY 	Keyword search Seed articles Snowball sampling Thematic Content Analysis	• A keyword search provides seed articles; • From these seed articles a relating articles are found through snowball sampling; • The outcome was a bundle of articles related to the keywords; • These articles were analysed further using a TCA.	Which aspects that are related to the use of a shared car could be influenced by aspects of a mobility hub?
STEP 2 KEY-PLAYER INTERVIEWS 	Determine required information and prepare interview questions Selecting Key-players Setting up the interview Semi-structured interview Transcribing interviews & Thematic Content Analysis	• Questions are prepared beforehand in such a way that they are relevant in answering the main research question; • A representative group of experts in the field of mobility hubs has been selected; • Agreements on practical issues were made; • The interview form provides room for exploring relevant ideas that came up; • The transcribed interviews were analysed with a TCA.	To what extend do mobility hubs and shared cars currently influence each other and is this reflected in the layout of hubs?
STEP 3 CASE STUDY 	Selecting the area Interview with residents Structure of the survey Thematic Content Analysis	• The target group exists of people who live nearby a mobility hub; • A semi-structured interview with residents has been held to get their real perspective; • Questions were open and closed; • A TCA found reoccurring themes.	Which aspects of a mobility hub could stimulate residents to use a shared car located at their nearby mobility hub?

TABLE 0-1 OVERVIEW OF THE USED RESEARCH METHOD

FINDINGS

In the extensive literature study 50 relevant articles were collected. The Thematic Content Analysis (TCA) that followed identified reoccurring themes. While going through the steps of the TCA (Appendix A) initial themes eventually began to form into main-themes and subthemes. This resulted in subthemes that are related to: financial aspects; functional requirements; personal requirements; aspects of the journey; the attitude of potential users; psychological influences; challenging characteristics of potential users and aspects of a mobility hub. By analysing their influence, it became apparent that the identified themes have a causal relationship with shared car usage and that certain aspects of a mobility hub (i.e. the moderator variable) could influence this relationship. Figure 0-1 represents an initial conceptual model to illustrate the relationships between the identified themes (i.e. the independent variables) and shared car usage (i.e. the dependent variable). By comparing the results of the literature study, the expert interviews and the interviews with residents this model is eventually expanded.

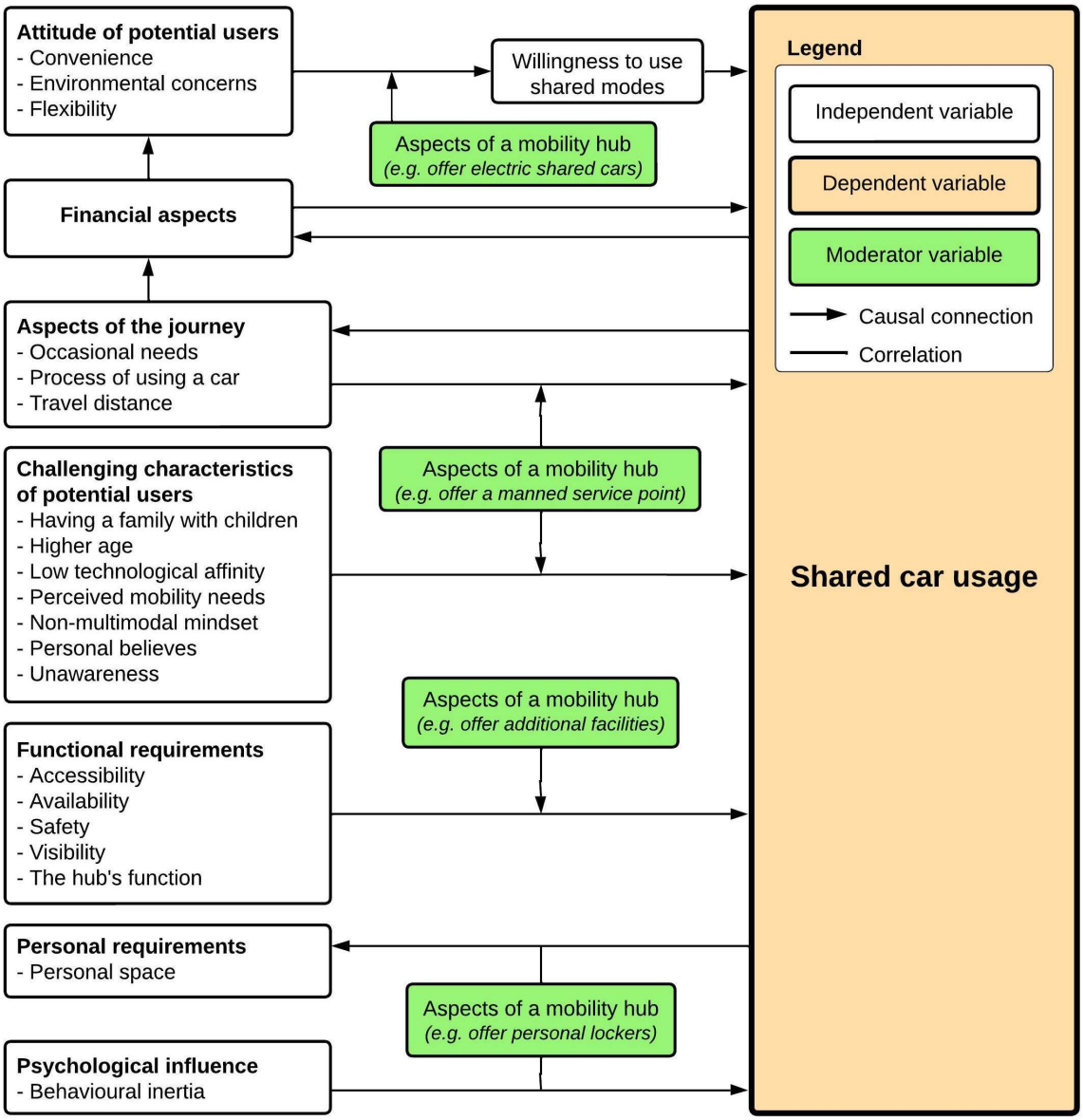


FIGURE 0-1 CONCEPTUAL MODEL SHOWING THE INFLUENCING FACTORS ON SHARED CAR USAGE

COMPARISON BETWEEN THE FINDINGS

The results of the literature study, the expert interviews and the interviews with the residents present overlapping findings as well as different outcomes. It is important to know whether the overlapping results strengthen each other and why different outcomes arise. Therefore, the findings in each method are analysed in this chapter. Table 0-2 shows the identified main-themes and in which TCA the subdivided themes exceeded a threshold (Paragraph 2.1.4, 2.2.5 and 2.3.3).

COMPARISON BETWEEN THE RESULTS

Table 0-2 shows that each conducted method in this research study concludes that the walking distance (i.e. **accessibility**) influences the use of a shared car. This is not surprising because this is widely recognized in previous studies. The influence of **availability** on shared car usage was not mentioned by enough experts to exceed the threshold. However, it is likely that when asked directly about it the experts would acknowledge the influence of availability on shared car usage, because the literature and the residents do so as well. The feeling of **social safety** is mainly recognized in foreign studies. It seems that **visibility** of a station-based shared car is not an issue when it is positioned on the street, like the majority of the shared car in The Netherlands. Previous literature seems to mainly focus on the location of a mobility hub and does not link this to the adoption of shared cars at the hub. This could explain the different outcome regarding the **hub's function in the transportation system** in the literature study.

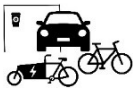
THE IDENTIFIED MAIN-THEMES WITH THEIR RELATED SUBTHEMES THAT EXCEEDED A THRESHOLD					
	MAIN-THEMES	**SUBTHEMES**	**Literature study**	**Expert interviews**	**Resident interviews**
		Threshold:	**> 10%**	**> 5 times**	**> 10%**
	**Financial aspects**	*Not divided in subthemes*			
	**Functional requirements**	Accessibility	X	X	X
		Availability	X		X
		Safety	X		
		Visibility		X	
		The hub's function		X	X
	**Personal requirements**	Personal space	X		
	**Aspects of the journey**	Occasional needs	X		X
		Process of using a car			X
		Travel distance			X
	**Attitude of potential users**	Convenience	X	X	X
		Environmental concerns	X		
		Flexibility	X		
	**Psychological influence**	Behavioural inertia	X		
	**Challenging characteristics of potential users**	Having a family with children	X		
		Higher age	X		
		Low technological affinity	X		
		Perceived mobility needs	X		
		Non-multimodal mindset	X		
		Personal believes	X		
		Unawareness			X
	**Aspects of a mobility hub**	Type of shared cars offered	X		
		The role of additional facilities		X	

TABLE 0-2 COMPARISON BETWEEN THE RESULTS

In theory the **personal space** component of a car seems to be an important influence. However, the results of the interviews with experts and residents indicate that in case travellers feel the need to use a shared car the personal space will not be a big enough barrier that would prevent them from using it.

Occasional needs seem to be the main reason to use a shared car. However, the experts more often linked the reasons to use a shared car to the function and location of the mobility hub that offers shared cars. They see this as more important, only thereafter the occasional needs would become important. The interview with the residents revealed that practical barriers like **the process of using a shared car** could prevent them from using a shared car at the mobility hub. It seems that the literature and experts underestimate this influence. It could be that the **travel distance** by shared car is not relevant once there is a need to use a shared car, which could explain why the literature and the experts do not mention it.

Each method concludes that the **convenience** travellers experience regarding their mode of transport influences the use of a shared. It seems however that the residents are unaware of the proposed convenience in the literature and mainly link convenience to parking convenience. The idea that using shared cars could provide **flexibility**, in comparison to owning a private car, is not recognized by the experts and residents. Five residents mentioned that they feel comfortable by their own routine and therefore do not like to try a shared car (i.e. **behavioural inertia**). The difference between the outcomes could be explained by the fact that for the majority

of residents this would not be a barrier. The keyword search included the key-word "Latent Class Analysis", because of this a lot of reviewed articles mentioned the **challenging characteristics**. It is however surprising that the literature does not mention **unawareness** (e.g. regarding the booking process or the availability of shared cars), while the residents indicate that this is important. Surprisingly, without the influence of low technological affinity the booking process was still seen as a barrier. The literature and experts hint that a **type of shared car** could be of influence, this is not established by the residents. Finally, it has to be noted that five residents mention that **additional facilities** would weigh in their consideration whether to use a shared car at the mobility hub. Although, it did not exceed the threshold in this TCA it still somewhat confirms what the experts are saying. The literature does not yet link it to the incentivization of shared cars at a mobility hub, which is not surprising since this was part of the knowledge gap.

THE ORDER OF IMPORTANCE

The comparison of the results in Table 0-2 suggests that the themes that should be considered of primary importance are the subthemes "convenience" and "accessibility", because their reoccurrence exceeded all three thresholds that are set in Paragraph 2.1.4, 2.2.5 and 2.3.3. In addition, the themes that should be considered to be of secondary importance are the subthemes "availability", "occasional needs", "type of cars offered" and "the hub's function in the transportation system". Finally, the themes that should be considered to be of tertiary importance are the subthemes that only exceeded a threshold in one of the TCAs. This indicates that the subthemes are not equally important and therefore their influence on shared car adoption varies. Therefore, the subthemes are divided into three levels. The level of a subtheme indicates to what extent their relationship with shared car usage influences its adoption. From largest influence an shared car adoption to lowest:

- **LEVEL 1: Subthemes that are of primary importance**

Convenience	Accessibility

TABLE 0-3 SUBTHEMES OF PRIMARY IMPORTANCE

The subthemes "convenience" and "accessibility" are mentioned by 10% or more of the articles in the extensive literature study (Chapter 3), are mentioned by more than 5 experts (Chapter 4) and are mentioned by 10% or more of the residents (Chapter 5). This indicates that these subthemes weigh the most in the decision-making process whether to use a shared car, compared to other subthemes.

- **LEVEL 2: Subthemes that are of secondary importance**

Availability	Occasional needs
Type of shared cars offered	The hub's function

TABLE 0-4 SUBTHEMES OF SECONDARY IMPORTANCE

The subthemes "availability" and "occasional needs" and are mentioned by 10% or more of the articles in the extensive literature study (Chapter 3) and are mentioned by 10% or more of the residents (Chapter 5). In addition, the subtheme "the hub's function in the transportation system" has been mentioned by more than 5 experts (Chapter 4) and by 10% or more of the residents (Chapter 5). This indicates that these subthemes weigh more in the decision-making process whether to use a shared car, compared to other subthemes.

- **LEVEL 3: Subthemes that are of tertiary importance**

Safety	Personal space	Flexibility
Visibility	The process of using a car	Travel distance
Additional facilities	Behavioural inertia	Family with children
Higher age	Low technological affinity	Perceived mobility needs
Non-multimodal mindset	Personal believes	Unawareness

TABLE 0-5 SUBTHEMES OF TERTIARY IMPORTANCE

The subthemes "safety", "visibility", "personal space", "flexibility", "the role of additional facilities" and all of the subthemes that relate to "challenging characteristics of potential users" exceeded only one of the thresholds (e.g. either mentioned in 10% or more of the articles or by 5 or more experts). This indicates that these subthemes weigh in a lesser degree in the decision-making process whether to use a shared car, compared to other subthemes.

CONCEPTUAL MODEL

The identified subthemes in Table 0-3 till Table 0-5 seem to affect shared car usage, because they exceed one or more of the thresholds that are set in Paragraph 2.1.4, 2.2.5 and 2.3.3. These subthemes are therefore independent variables that have a causal relationship with the use of shared cars (i.e. the dependent variable). This relationship could be influenced by aspects of a mobility hub (i.e. moderator variables). Based on the influence of the identified subthemes, suggestions have been made for the guidelines that a mobility hub should fulfil in order to influence these relationships (Paragraph 3.4.1, 4.4.1 and 5.5.1). In addition, the subthemes influence each other's relationship with shared car usage as well. Therefore, the initial conceptual model in Figure 0-1 has been expanded and now presents:

- direct causal relationships between the identified subthemes and shared car usage (**bold arrows**);
- the influences that the identified subthemes have on each other;
- and the influences that the guidelines of a mobility hub have on these relationships.

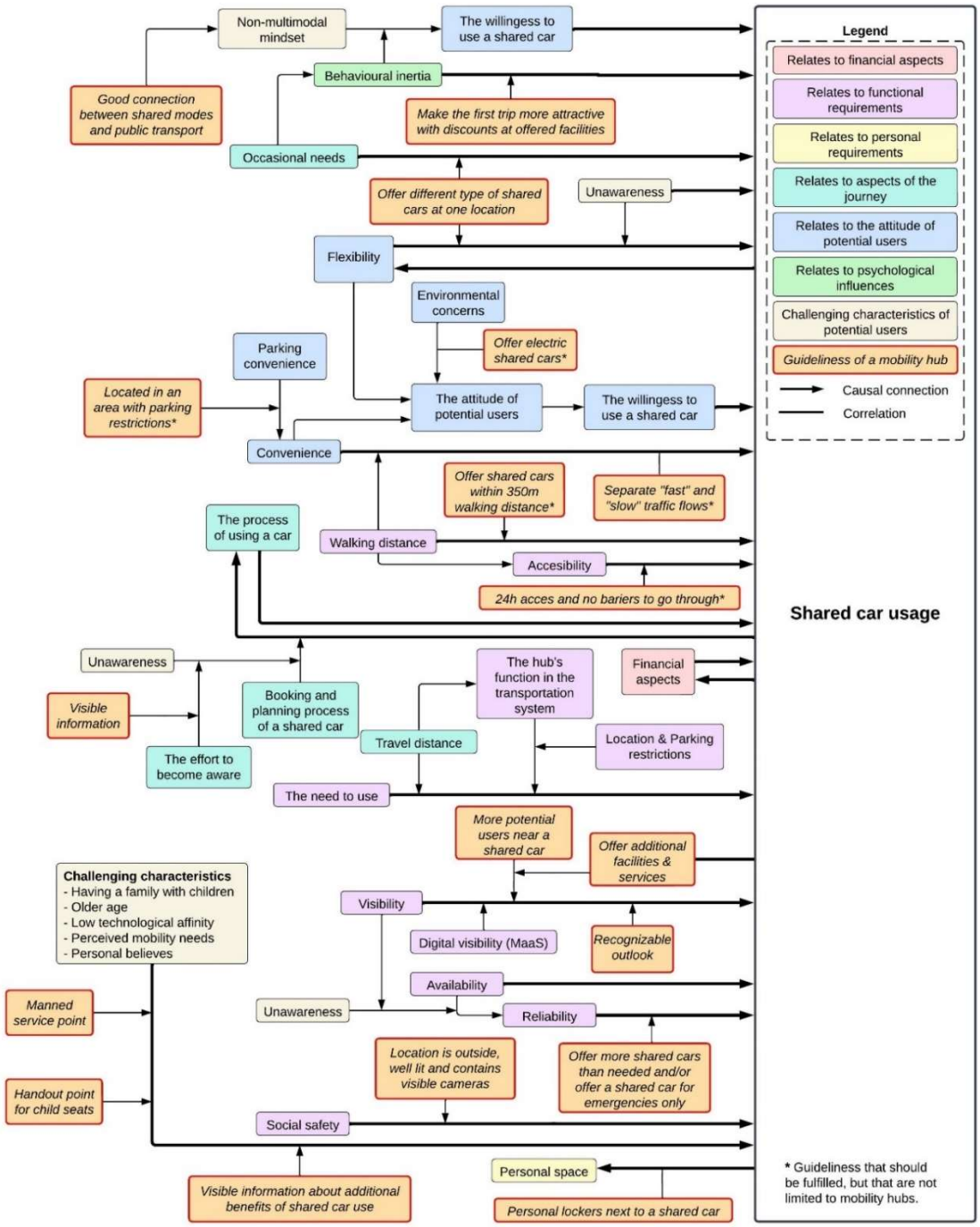


FIGURE 0-2 CONCEPTUAL MODEL SHOWING THE INFLUENCING FACTORS ON SHARED CAR USAGE

CONCLUSIONS

This research study showed that there are indeed factors of a mobility hub that can influence the adoption of shared cars located at the hub. The sub questions have answered to what extent a mobility hub can play a role in this adoption.

To gain insight in what kind of aspects of a mobility hub would attract travellers to use a shared car at the hub it is important to get to know the potential users and learn about why they make certain choices regarding their mode of transport. Therefore, the extensive literature study answered which aspects that are related to the use of a shared car could be influenced by aspects of a mobility hub (**sub question 1**);

The choice whether to use a shared car is influenced by tangible factors, such as: financial aspects; functional requirements, aspects of the journey and aspects of a mobility hub. Furthermore, intangible factors, such as: the attitude of potential users, personal requirements, psychological influences and challenging characteristics of potential users are of influence. The relationships between these factors and shared car usage could be influenced by a mobility hub.

Comparing previous studies towards the adoption of shared cars and mobility hubs indicated that tangible and intangible factors affect shared car usage, but it did not yet establish the influence of mobility hubs. Therefore, the expert interviews answered to what extend shared cars and mobility hubs currently influence each other and whether this is reflected in the layout of hubs (**sub question 2**);

The main influence of a mobility hub is to attract more potential users to hub by offering additional facilities and services. Increasing the potential users near a shared car could increase its visibility. This is not yet reflected in the layout of the hub, partly because whether residents make use of a mobility hub would mainly depend on the hub's function in the transportation system. The shared car offers an extra travel option at a mobility hub, which could attract more travellers to a hub and with that increase the visibility of other shared or public modes of transport.

The experts indicate that a mobility hub could influence the adoption of shared cars, but do not argue from actual facts or practical experience. Therefore, the interviews with residents answered which aspects of a mobility hub could stimulate them to use a shared car located at their nearby mobility hub (**sub question 3**);

The aspects of a mobility hub that could stimulate the residents to use a shared car at the hub are: offering shared cars that resonate with occasional needs, ensuring availability of shared cars and providing information about the booking- / registration process & the accompanied costs. In addition, flanking policies and the hub's function in the transportation system influence the use of the shared cars that are located at the hub, because the residents indicate that there is often no need for them to use a shared car at this mobility hub.

The data that has been collected for each sub question has been analysed with a Thematic Content Analysis (TCA). A TCA is used to analyse the data because there is a gap in the existing literature regarding the subject, the reasoning of experts is not based on actual facts or practical experience with the subject and the residents often have no experience with the mobility hub or answer in possible (future) scenarios. This resulted in reoccurring themes that influence shared car usage (i.e. influential factors).

The conceptual model in Figure 6-1 presents a combined result of the sub questions and shows that in case a mobility hub fulfils certain guidelines it has an influence on the relationships between the influential factors and shared car usage. To which extent a guideline influences these relationships depends on the importance of the subthemes it is based on (Table 6-8 till Table 6-10). Therefore, the guidelines that a mobility hub should fulfil are translated to primary, secondary and tertiary guidelines to determine to which extent a mobility hub could influence the adoption of shared cars located at the mobility hub (**main research question**);

The different levels insinuate to what extent the guidelines of a mobility hub could influence the adoption of shared cars at the hub. By fulfilling the guidelines, a mobility hub can be developed in such a way that it considers the tangible and intangible aspects potential users value to attract more potential users to the hub and lower the barrier of using a shared car located at the mobility hub.

- **LEVEL 1:** - *Based on the subthemes that are of primary importance (Table 0-3)* - **If the mobility hub fulfils the primary guidelines it likely has the largest influence on the adoption of the shared cars located at the hub.**

- **LEVEL 2:** - *Based on the subthemes that are of secondary importance (Table 0-4)* - **If the mobility hub additionally fulfils the secondary guidelines it likely increases the use of the shared cars that are located at the hub.**

- **LEVEL 3:** - *Based on the subthemes that are of tertiary importance (Table 0-5)* - **If the mobility hub also fulfils the tertiary guidelines it is likely that more potential users are incentivized to consider the use of a shared car at the hub.**

The different levels insinuate to what extent the guidelines of a mobility hub could influence the adoption of shared cars at the hub.

RECOMMENDATIONS FOR POLICYMAKERS AND HUB DEVELOPERS

The comparison of the results in Table 0 2 suggests that the primary guidelines for a mobility hub should be based on the influences of the subthemes "convenience" and "accessibility". In addition, the secondary guidelines should be based on the influences of the subthemes "availability", "occasional needs", "type of cars offered" and "the hub's function in the transportation system". Finally, the tertiary guidelines should be based on the influences of the subthemes that only exceeded a threshold in one of the TCAs.

Regarding the primary guidelines a mobility hub should…

… advocate the benefits of shifting from car ownership to the use of a shared car at the hub.
… create the idea that residents can use a shared car at any time by:
  offering more shared cars than needed;
  and/or reserving shared cars for emergencies only.
… offer shared cars within a 350m radius from the resident's home.
… increase the ease of use of shared cars located there by:
  making them easy to access and not have any barriers or doors to go through;
  and separating "fast" and "slow" traffic flows.
… be located in an area where parking restrictions make it less favourable to own a car.

Regarding the secondary guidelines a mobility hub should additionally…

… be compatible with certain needs at a specific point of time by offering different types of cars (e.g. in size or rent structure) to attract potential users for certain activities.
… especially make a first trip with a shared car attractive (e.g. offer a diversity of shared cars so that occasional needs can be fulfilled).
… be located further away from public transport and destinations for which residents might need a car.

Regarding the tertiary guidelines a mobility hub should additionally…

… the mobility hub should be a space where people feel safe around day and night.
… decrease the burden of using a shared car with children (e.g. by handing out child seats).
… have a manned service point where people with low technological affinity can get help with the booking process.
… increase the visibility of the shared cars located there by:
  having a uniform recognizable appearance;
  being visible on MaaS-apps;
  offering additional facilities to attract potential users to the hub.
… provide easily accessible, clear and visible information (e.g. with an information board) regarding the booking process and the costs of a shared car per provider.

The level of a guideline suggests to what extend the mobility hub could influence the adoption of shared cars at the hub. In case mobility hubs are developed without considering the suggested guidelines, the adoption of shared cars at a mobility hub will remain in a larger degree uncertain.

TABLE OF CONTENTS

1 INTRODUCTION

Dutch cities experience space scarcity due to the joint demand for space by housing, work locations, infrastructure, greenery, open water and energy transportation (Hamers et al., 2021). At the same time, cars take up unnecessary space because they are parked more than 90% of the time (KiM, 2018) and in addition they are a substantial contributor to the emission of greenhouse gasses (European Commission, n.d.).

1.1 THE NEED FOR A SUSTAINABLE MOBILITY SYSTEM

In the Netherlands there is a need for a more sustainable transportation system with shared modes of transportation (e.g. shared cars) that in total sum emit less CO2 and uses less space than the conventional mobility system.

1.1.1 THE NEED TO REDUCE GREENHOUSE GAS EMISSIONS

In order to decrease the greenhouse gas emissions, The Dutch government made "The Climate Agreement" a part of their policy. This agreement is signed by many organizations and companies within the Netherlands and has the main goal to reduce greenhouse gas emissions (Dutch Ministry of Economic affairs and Climate, 2019), by 55% in 2030 compared to the year 1990 (Eerste Kamer der Staten-Generaal, 2023). However, in The Netherlands the Planning Bureau of the Living-environment (PBL) concluded in November 2022 that the gap to achieve this goal is increased in 2021, while the time to achieve the goal has decreased, Figure 1-1. PBL urges that there is a need to formulate additional policies and to speed up the implementation of existing plans to achieve the climate goals set for 2030. Existing plans contain a transition of the conventional mobility system towards a more **sustainable mobility system**. This transition partly depends on the adoption of shared mobility (e.g. shared cars), which is illustrated in the study by Chen and Kockelman (2016). Their results suggest that current carsharing members reduce their average individual transportation energy use and greenhouse gas emissions by approximately 51% upon joining a carsharing scheme.

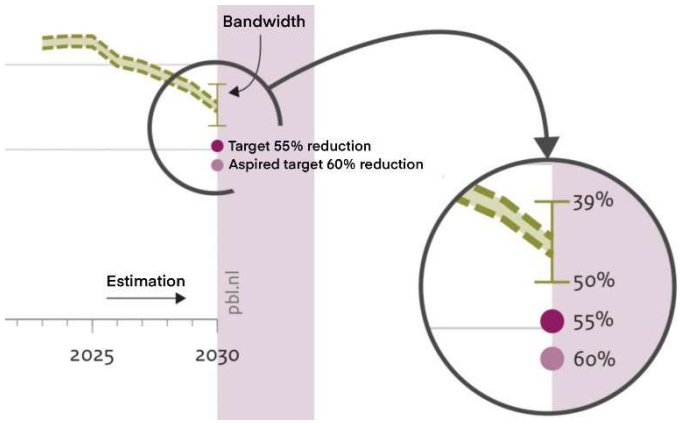


FIGURE 1-1 EXPECTED GAP IN REDUCTION OF MEGATONS OF CO_2 EQUIVALENTS BY PBL (2022) CONSIDERING THE GOAL OF 55% REDUCTION (SOURCE: PLANNING BUREAU OF THE LIVING-ENVIRONMENT, 2022)

1.1.2 THE NEED FOR EFFICIENT USE OF SPACE

Hamers et al. (2021) illustrate that Dutch cities experience space scarcity. This suggests that in the mobility system a transition in space allocation is needed, since most mobility modes are dependent on urban open space for circulation and the storage of vehicles (Petzer et al., 2021). Since each shared car usually can serve more than one person, a carsharing fleet is expected to replace more private cars than the number of shared cars, consequently reducing the total number of cars (Liao et al, 2018). Therefore, incentivizing the use of shared cars could potentially aid in both the problem of space scarcity in dense cities and the redundancy of greenhouse gas emissions.

1.2 THE PUZZLE OF A SUSTAINABLE MOBILITY SYSTEM

A SUSTAINABLE MOBILITY SYSTEM
A more green and sustainable system that through the use of shared transportation modes (e.g. shared cars) in total sum emits less CO2 and uses less space than the conventional mobility system.

In the pursuit of creating a more sustainable mobility system related studies focus mainly on changing travel behaviour, travellers' characteristics and preferences, shared mobility, related technological developments and accompanied business cases. These pieces are all deemed important and should fit together to transform the conventional transportation system towards a sustainable mobility system.

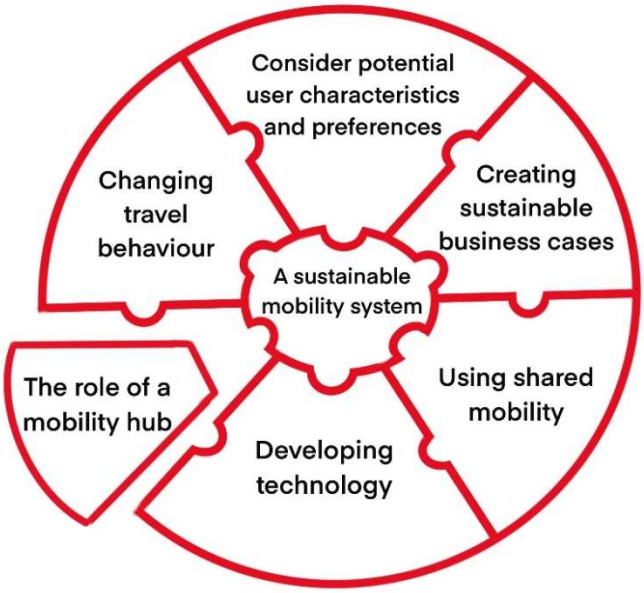


FIGURE 1-2 THE PUZZLE OF A SUSTAINABLE MOBILITY SYSTEM

To understand the puzzle of a sustainable mobility system and its relevance in this research study, for each piece their purpose and connection to a mobility hub are described in Paragraph 1.2.1 till 1.2.5. In the existing research one piece seems to be missing: the role of a mobility hub in shared car adoption. This knowledge gap is described in Paragraph 0.

1.2.1 THE VALUE OF DEVELOPING TECHNOLOGY

The most relevant **technology** for mobility hubs and shared cars exists of mobile applications. The development of these digital technologies is becoming increasingly important as new mobility services, especially of shared modes, usually rely on digital interfaces for the planning, booking, and payment of services as well as information provision (Geurs et al., 2023). Therefore, the level of digital integration can affect the potential uptake of the mobility offerings (CoMoUK, 2019, as cited in Geurs et al., 2023).

TECHNOLOGY
The development of digital technologies has the potential to increase the visibility of a shared car at a mobility hub and make the booking process of a shared car easier. Therefore, it could increase the adoption of shared cars at a mobility hub.

For example, the promise of Mobility-as-a-Service (MaaS) is to deliver digital integration of mobility option (i.e. planning, booking, and payment using a single app or platform). MaaS is relevant for hubs as it makes it easier to use different transport modes and improves digital access to the services of different providers present at the hub (Geurs et al., 2023). There is a growing interest in the development of MaaS in recent research studies. Furthermore, newly developed technology makes it possible for users to open a shared car with their mobile phone. Which could be seen as an important technological development as this increases the convenience of the journey.

1.2.2 THE VALUE OF CHANGING TRAVEL BEHAVIOUR

Travel behaviour refers to how people move over space, how they travel from point A to B, and how they use transport (Durand et al., 2018). Introducing a relatively new mode of transport like shared cars at a mobility hub therefore initiates a change in travel behaviour. In addition, it is generally believed that psychological factors (attitudes and perceptions) play an important role in explaining individual differences in travel behaviour and travel-related choices (Kroesen & Chorus, 2020).

Moreover, the study of Kroesen and Chorus (2020) suggests that policies aimed at lowering the convenience of using the private car will be more effective to change travel behaviour than those focused on increasing the beliefs that other modes are more healthy or environmentally friendly. Which indicates that making the mobility hub more attractive is not enough on its own. For example, flanking policies (e.g. parking restrictions) are needed in the surrounding area of the mobility hub to create a need for the use of the shared cars that are located at the hub.

TRAVEL BEHAVIOUR
Travel behaviour refers to how people move over space, how they travel from point A to B, and how they use transport (Durand et al., 2018).

1.2.3 The value of considering potential user characteristics and preferences

The use of shared mobility (e.g. shared cars) depends on the user's needs and convenience (Machado et al., 2018). These needs could originate from the users' characteristics (e.g. having a family with children). According to Rongen et al. (2022), these user characteristics, or "key-attributes" as they call them, determine the travellers' choice for a certain transportation mode. For example, Van Rooij (2020) indicated in his research that the most likely user of a mobility hub can be described as a young male with a low education level, a low income, who lives with his family, who has used shared mobility before and does not own, or have access to, a car.

This kind of **user characteristics and preferences** influence what the preferred travel option is. Which suggests that the characteristics and preferences of potential users weigh in their decision-making process whether to use a shared car. Rongen et al. (2022) mentions that insights into these potential user characteristics and preferences relating to integrated systems (e.g. carsharing systems) are not routinely incorporated into policies. Meanwhile, co-creating mobility hub designs with (potential) users to match the design with user needs, could promote the use and acceptance of the mobility services provided at the hub, and therefore increase its social impacts (Geurs et al., 2023). So far, it seems that mobility hubs are not yet designed to be in line with the needs of the potential user. Therefore, the potential users are not optimally incentivized to use a shared car located at a mobility hub.

USER CHARACTERISTICS AND PREFERENCES
The used definition of user characteristics and preferences are in line with the key-attributes that influence the traveller's mode of transport choice, which are according to Rongen et al. (2022):

- Socio demographic characteristics
- Personal values
- Freedom of choice
- Habitual behaviour
- The perception of alternative modes.

1.2.4 The value of creating sustainable business cases

Urban mobility is currently facing a variety of challenges (Matowicki et al., 2022). In response to new mobility concepts (e.g. shared cars), business models are currently emerging, primarily through improvements in IT infrastructure and the profitable collaboration of various players (Matowicki et al., 2022). Such a profitable collaboration between the stakeholders of a mobility hub (e.g. shared car providers and municipalities) starts by creating a **sustainable business case**.

However, it is often unclear in which degree residents will adopt the use of shared cars that are located at a mobility hub. Therefore, it could be more difficult to create a sustainable business case for the mobility hub. A mobility hub has the potential to strengthen the business case. A strong business case is needed to attract investors and guarantee the continuity (i.e. sustainability) of the hub. It is believed that a mobility hub could offer additional benefits which could make the use of the shared cars located there more attractive. Land-use planning at hubs enables governments to engage private investors and because of their strategic locations, hubs are of commercial interest (Rongen et al., 2022). Therefore, if a mobility hub is seen as a place of exploitation (e.g. with additional facilities like a postal office), and not just a parking space that offers shared cars, it could potentially strengthen the business case and ensure continuity of the mobility hub.

SUSTAINABLE BUSINESS CASE
A business case that ensures the continuity of a project, such as a mobility hub.

1.2.5 THE VALUE OF SHARED MOBILITY

Shared mobility is characterised by the sharing of a vehicle and the use of technology to connect users and providers (Santos, 2018). Shared mobility is needed because according to Pojani and Stead (2016), some trends in many cities around the world are: extensive urban sprawl, rapidly-growing motorization, inadequate public transport systems, chaotic traffic patterns with high use of cars and motorcycles, high environmental pollution, and poor infrastructure for pedestrians and cyclists. Thus, more people prefer to own and use private vehicles, further aggravating the problems (Enoch, 2012, as cited in Machado et al., 2018). Shared mobility is enabling the number of private vehicles per household to decrease, and creating a new mentality in which users renounce ownership of a vehicle and use shared transportation services according to their convenience (Machado et al., 2018).

For example, carsharing systems are valued for their environmental role by Machado et al. (2018). Such a system of shared cars has the potential to reduce car ownership, decrease CO2 emissions and solve space scarcity problems in dense cities. This suggests that they are an important part of the transition towards a sustainable mobility system. **Shared cars** provide the ability to share a public car on demand. These shared cars are provided by a private business to be used for the public (e.g. Greenwheels). Therefore, a shared car represents the idea of providing a public car that can be used as easily as a private car (Mavlutova et al., 2021). A shared car can either be offered as free-floating, station-based or at a mobility hub.

SHARED MOBILTIY
Shared mobility is characterised by sharing a vehicle and the use of technology to connect users and providers (Santos, 2018).

SHARED CAR - *A public car that can be used on demand.*
This study focusses on shared cars located at mobility hubs because a hub could potentially play a role in incentivizing the use of shared cars located at the hub.

1.2.6 THE POTENTIAL ROLE OF A MOBILITY HUB IN SHARED CAR ADOPTION

Mobility hubs are defined by Claasen (2020) as locations in residential areas, where shared cars, electric bicycles and electric cargo bicycles are offered together. Mobility hubs with those characteristics are described by Blad et al. (2022) as a solution to the high greenhouse gas emissions and the declining quality of life (e.g. space scarcity) caused by private vehicles. Offering a shared car at a mobility hub attracts a wider range of potential users to the hub, compared to other shared and public modes of transport, because of its unimodal roundtrip characteristic. The presence of a shared car at a mobility hub is even indicated by Claasen (2020) as the most important system characteristic in the choice to use a mobility hub. In addition, Claasen (2020) found that the potential effect of mobility hubs on household car ownership is a reduction of 15% in the investigated inner-city neighbourhoods and 11% in the investigated suburban neighbourhoods.

However, nowadays the majority of the people still prefers using a private car over the use of a shared car. Part of the reason why could be that the benefits of a free-floating and/or station-based shared car does not yet outweigh the benefits of the private car. It is believed by the author that when a shared car is located at a mobility hub, the hub could add benefits to the use of a shared car (e.g. offer service) and with that make its adoption more likely. Claasen (2020) does already describe that mobility hubs must satisfy the guidelines of the residents to live up to their potential. However, to what extend a mobility hub could play a role in the adoption of shared cars located at the hub seems to be an unresearched niche.

MOBILITY HUB
For the purpose of this study a mobility hub is defined as a location in a residential area that, is disconnected from train stations, offers a variety of shared transport modes and next to this could have multiple functions (i.e. offer additional facilities or services).

1.3 Problem definition & Knowledge gap

Previous research studies have been focused on the adoption of shared cars and mobility hubs separately. Which is why there exists a knowledge gap regarding the influence of a mobility hub on the adoption of shared cars. The adoption of shared cars depends both on the aspects of a journey that are valued by travellers, and the features regarding a mode of transport that are valued by travellers. Therefore, the adoption of shared cars at a mobility hub will remain in a larger degree uncertain in case these aspects are not considered in the layout of a mobility hub. For example, the popularity of the private car could indicate which aspects of the journey (e.g. the flexibility) should be considered in the development of a mobility hub. However, it is unknown how the values of potential users could be considered in guidelines for the layout of a mobility hub. When these guidelines are known the mobility hub could be developed in such a way that the adoption of the shared cars located there becomes more likely.

1.4 Research objective

The objective of this research study is to reduce the knowledge gap by defining guidelines a mobility hub should fulfil in order to play a role in the adoption of shared cars located at the hub. By defining these guidelines, it becomes apparent to what extend a mobility hub could influence this adoption. This is based on insights resulting from an extensive literature study (sub question 1, Chapter 3), interviews with experts (sub question 2, Chapter 4) and interviews with residents who live within a 350m radius of a mobility hub (sub question 3, Chapter 5).

1.5 Research questions

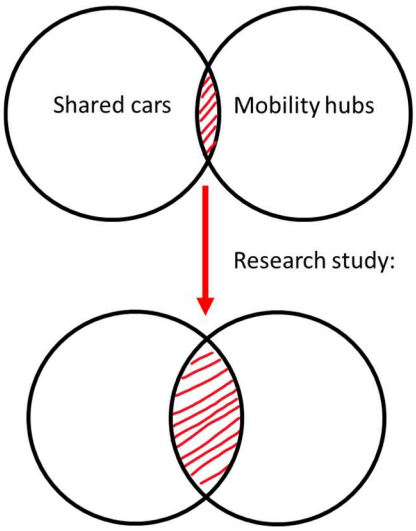


FIGURE 1-3 EXPANDING THE KNOWLEDGE

The effects of shared cars and mobility hubs have been researched separately. Which is why information is missing regarding which aspects a mobility hub should possess to make the use of shared cars located there more attractive and so make their adoption more likely. This qualitative research study aims to fill this knowledge gap by answering the main research question:

To what extent could a mobility hub play a role in the adoption of shared cars located at the mobility hub?

First, a literature study provides insight in which aspects that relate to the use of a shared car could be influenced by a mobility hub. Second, expert interviews contribute to the knowledge regarding the mutual influences between mobility hubs and shared cars. Third, a case study captures what stimulates residents to use a shared car at their nearby mobility hub.

Multiple angles had to be researched as unilateral answering the main research question was not possible. Therefore, to answer the main research question the following sub research questions have been set up and answered:

SUB QUESTION 1:
Which aspects that are related to the use of a shared car could be influenced by aspects of a mobility hub?

SUB QUESTION 2:
To what extend do mobility hubs and shared cars currently influence each other and is this reflected in the layout of hubs?

SUB QUESTION 3:
Which aspects of a mobility hub could stimulate residents to use a shared car located at their nearby mobility hub?

1.6 Scientific relevance

This qualitative research study contributes to the domain of developing mobility hubs by focusing on the role of a mobility hub in the adoption of the shared cars located at the hub. First, the knowledge regarding what potential users of shared cars value at a mobility hub is clustered in Chapter 3, which now provides a clear overview. Second, the expert interviews contribute to the knowledge regarding the mutual influence between shared cars and mobility hubs in Chapter 4. Third, new insights are provided regarding factors that stimulate residents, in their perception, to choose for a shared car located at a mobility hub in Chapter 5.

1.7 Practical relevance

This research study provides a focus for the development of mobility hubs. It is mainly relevant for existing urban neighbourhoods as this was the focus of the case study. The suggested guidelines in Chapter 7 could be used for future policies regarding the layout of mobility hubs in the Netherland. The results indicate that there is a certain order to follow regarding the implementation of guidelines. It is suggested that the adoption of shared cars at a mobility hub will increase the most when the primary guidelines are considered in the layout of the hub. In case this does not provide the aspired result, the secondary and thereafter the tertiary guidelines could be implemented.

1.8 Scope of the research

This qualitative research study has the goal to provide insights in whether the benefits of services and facilities at a mobility hub can play a role in making the use of a shared car more interesting for potential users. These services and facilities would have to be in line with the characteristics and preferences of the potential users to attract them to the shared car located at the hub. Therefore, the following is within the scope of this research:

- The role and attributes of mobility hubs as benefits for shared cars located at the mobility hub;
- The characteristics of travellers and their preferences regarding modes of transport;
- The perception of policy makers in Dutch governmental bodies who are or have been involved in the development of mobility hubs in the Netherlands;
- The perception of experts who are or have been involved in the development of mobility hubs in the Netherlands.
- The perception of residents who live within a 350m radius of a **mobility hub**, as the CROW (2021, Table 8.4/2) specifies that: people accept a walking distance of 100-350m to a shared car (Andringa, 2022).

For the following elements it is less obvious that they are excluded from the scope of this research and are therefore listed here: Mobility hubs which do not reserve a space for shared automobiles; Travellers' preferences regarding other modes of transport located at mobility hubs, other than recognising it as an potential preference to be an attribute for the hub; User perspectives on autonomous vehicles; Tourists perceptions; Ride hailing services; Ride sourcing services; Travel behaviour under impact of COVID-19; Related research that regards developing countries; The location of where the potential users live.

1.9 Thesis structure

This thesis starts with Chapter 2, which provides an overview of the qualitative research method and represents how and why each of the methods are applied to answer the sub questions. Chapter 3 reviews previous literature regarding to which aspects could influence the choice of potential users whether to use a shared car at a mobility hub. Chapter 4 presents the findings that are gathered during expert interviews to answer sub question 2. Chapter 5 analyses a case study based on the interviews with residents. Chapter 6 compares the collected results and present the findings in a conceptual model. Chapter 7 provides conclusions of the sub- and main research questions and presents recommendations. Finally, Chapter 8 discusses the results of this qualitative research study and suggest follow-ups for future research.

2 RESEARCH METHODOLOGY

This chapter provides the overview of the qualitative research methodology that answers the main research question. The qualitative methodology is used because it adds value by generation knowledge, not only by discovering the unknown, but also by re-conceptualizing of what is already known (Eakin & Gladstone, 2020). A literature study answers sub question 1, interviews with experts answers sub question 2 and interviews with residents (i.e. the case study) answers sub question 3. The research method is presented in Figure 2-1.

To what extent could a mobility hub play a role in the adoption of shared cars located at the mobility hub?

Method		Description	Sub question
STEP 1 LITERATURE STUDY 	Keyword search Seed articles Snowball sampling Thematic Content Analysis	• A keyword search provides seed articles; • From these seed articles a relating articles are found through snowball sampling; • The outcome was a bundle of articles related to the keywords; • These articles were analysed further using a TCA.	Which aspects that are related to the use of a shared car could be influenced by aspects of a mobility hub?
STEP 2 KEY-PLAYER INTERVIEWS 	Determine required information and prepare interview questions Selecting Key-players Setting up the interview Semi-structured interview Transcribing interviews & Thematic Content Analysis	• Questions are prepared beforehand in such a way that they are relevant in answering the main research question; • A representative group of experts in the field of mobility hubs has been selected; • Agreements on practical issues were made; • The interview form provides room for exploring relevant ideas that came up; • The transcribed interviews were analysed with a TCA.	To what extend do mobility hubs and shared cars currently influence each other and is this reflected in the layout of hubs?
STEP 3 CASE STUDY 	Selecting the area Interview with residents Structure of the survey Thematic Content Analysis	• The target group exists of people who live nearby a mobility hub; • A semi-structured interview with residents has been held to get their real perspective; • Questions were open and closed; • A TCA found reoccurring themes.	Which aspects of a mobility hub could stimulate residents to use a shared car located at their nearby mobility hub?

FIGURE 2-1 OVERVIEW OF THE USED RESEARCH METHODOLOGY

In each method the collected data is analysed with a Thematic Content Analysis (TCA) to identify reoccurring themes, following the method in the paper by Anderson (2007) as explained in Appendix A). Quantifying the textual data with a TCA enables a comparison between multiple sources of textual information (e.g. literature and transcripts). Applying this method therefore makes it possible to compare the data of the extensive literature study, the expert interviews and the interviews with residents.

It is suggested that a theme is important when the number of times it reoccurs exceeds a threshold set in Paragraph 2.1.4, 2.2.5 or 2.3.3 (e.g. in case it is mentioned in 10% or more of the reviewed articles). The themes that exceed the threshold in all three TCAs are considered to be of primary importance regarding the adoption of shared cars. In addition, the themes that exceed the threshold in two of the TCAs are considered to be of secondary importance. Finally, the themes that only exceed a threshold in one of the TCAs are considered to be of tertiary importance.

2.1 Step 1 - Extensive literature review 

The extensive literature study has the goal to get to know the potential users, learn about why they make certain choices regarding their mode of transport and to gain insight in what kind of aspects of a mobility hub would attract them to use a shared car at the mobility hub. With a literature study the related knowledge can be mapped and knowledge gaps are exposed. The literature study therefore does not only provide relevant insights, but also provides input for the interviews with the experts and the residents. Therefore, an extensive literature study has answered *sub question 1: "Which aspects that are related to the use of a shared car could be influenced by aspects of a mobility hub?"*.

2.1.1 Step 1.1 - Keyword search

As a first step of the extensive literature study a keyword search has been conducted to collect articles that link user characteristics and preferences to transport mode choice. Researching the characteristics of travellers provide insights into potential users of shared cars. Therefore, previous research studies that cluster travellers with a Latent Class Analysis (LCA) have been included in the keyword search. Clustering the potential users indicates which aspects could stimulate shared car usage and which aspects are perceived as a barrier. For example, in case in a cluster the percentage of car-use is high in combination with a certain characteristic (e.g. having a family with children), this could indicate that certain aspects of a private car are valued and could influence the use of shared cars. Therefore, the keywords that have been put into the academically accepted search engine google.sholar.com, are: Latent Class Analysis and user characteristics & preferences, both in combination with:

- … shared mobility / shared cars / carsharing
- … private car owners
- … travel behaviour
- … potential modal shift

2.1.2 Step 1.2 - Seed articles

The articles found in the keyword search are sorted separately for *backward and forward snowball sampling* based on their relevance. For both a top three has been made. These publications in the top three are further referenced as "seed articles". The relevance for backward snowballing is determined by: (1) whether the article provides relevant information about the used keywords in the search engine and (2) the publication date of the article. As a result of the recent increased interest towards mobility hubs most of the related articles are dated from after the year 2020. Therefore, related studies dating from 5 years before this point are considered out of date, which means that articles dated from before 2015 will not be included. Additionally, the relevance of the seed articles was determined by: (3) the times the article is cited. This way the most and relevant articles were found in order to conduct the snowball sampling.

2.1.3 Step 1.3 - Citation network through snowball sampling

The next step is based on a citation analysis. A network of citation has been created through forward and backward snowball sampling.

Forward: Articles that cite the seed articles are collected at the first level, then articles that cite the articles that cite the seed articles are collected at the second level, etc.

Backward: Articles that are cited in the seed articles are collected at the first level, then articles that are cited in the articles that are cited in the seed articles are collected at the second level, etc.

With this technique three levels of data collection are generally sufficient to map a domain. This produces a network of relevant articles built around the seed articles and facilitates insights into the broad context of the research instead of (only) the narrow set of publications that are returned in keyword searches (Lecy & Beatty, 2012).

SAMPLING RATE

The proportion of articles collected at each level is called the sampling rate. Constraining the sample rate prevents the creation of large irrelevant data. Lecy & Beatty (2012) demonstrates through a simulation that with a sample rate of 50 per cent the most central nodes in the network (of articles) are identified with more than 90 percent accuracy. Therefore, the sampling has been done with a sample rate of 50 percent. For each iteration the relevance of the article determines if the article is within the 50 percent and thus considered in the next iteration.

2.1.4 STEP 1.4 - THEMATIC CONTENT ANALYSIS

Reoccurring themes in the articles are labelled and categorized using a Thematic Content Analysis (TCA), because the gathered data exists solely of textual information and no literature exists yet that describes to what extend a mobility hub could play a role in the adoption of shared cars located at the hub. The value of a TCA is that it makes it possible to systematically code and categorize large amounts of textual data in cases where there are no previous studies dealing with the phenomenon (Vaismoradi et al., 2013). For example, with the TCA themes are identified by bringing together components or fragments of ideas or experiences, which often are meaningless when viewed alone (Aronson, 1994, as cited in Nowell et al., 2017). This makes it possible to indicate a solution framework based on related literature. After 50 articles data saturation was reached as, except for one, no new themes were found in the last 10 articles. This is represented in Figure 2-2.

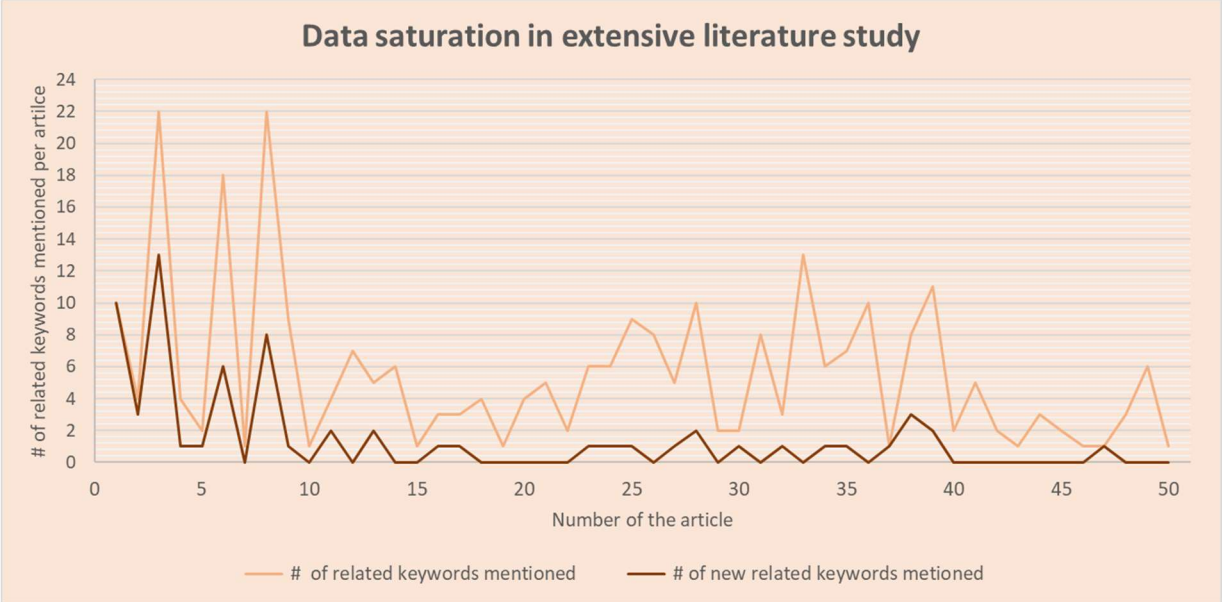


FIGURE 2-2 DATA SATURATION THEMATIC CONTENT ANALYSIS LITERATURE

Initial themes eventually began to form into main-themes and subthemes (Appendix B). The main-themes are used throughout the research study to provide a structured comparison between the multiple sources of textual information (e.g. literature and transcripts). By analysing their influence, the subthemes are used to determine the guidelines a mobility hub has to fulfil in order to play a role in the adoption of shared cars located at the hub.

In case a subtheme is mentioned in 10% or more of the articles it is considered that it has enough data to support it. With a data set of 50 articles this means that at least 6 articles will have to mention the subtheme. Which would indicate that it has a connection to the research objective. What this connection means for the role of a mobility hub is determined by analysing it in more depth. Therefore, a qualitative description is made regarding all that has been mentioned with a connection to the subtheme. The value of a qualitative description lies not only in the knowledge that can originate from it, but also because it can result in establishing meaningful and solid findings (Vaismoradi et al., 2013). Based on this description a potential role for a mobility hub in the adoption of the shared cars located at the mobility hub is suggested.

2.2 STEP 2 - EXPERT INTERVIEWS

The goal of the expert interviews is to supplement the theory with practical findings. Interviewing is a qualitative research method that is an essential element to obtain information from field experts (Spruijt, 2016). This is an essential element in this research study because the literature regarding the role of mobility hubs in shared car adoption is limited and does not provide a conclusive answer. Therefore, experts in the domain of shared cars and mobility hubs were interviewed to answer *sub-question 2: To what extend do mobility hubs and shared cars currently influence each other and is this reflected in the layout of hubs?*

To gather the required information, it was important that certain steps were followed in setting up the interview:

1. Determining the required information and preparing the interview questions accordingly;
2. Selecting the right persons in the field of the subject;
3. Defining the interview structure in a way as much relevant information as possible is gathered;
4. Transcribing and analysing the gathered information.

2.2.1 STEP 2.1 - REQUIRED INFORMATION AND PREPARATION OF INTERVIEW QUESTIONS

The information gathered from the interview should be in line with the research objective. Therefore, interview questions have been determined beforehand and tested with a supervisor from AT Osborne. To support answering the main research question the interview questions were related to sub question 2: “To what extend do mobility hubs and shared cars currently influence each other and is this reflected in the layout of hubs?”. Insights derived from the literature study were also a subject in the interview questions. With this method a relevant question list is composed to obtain the needed information.

2.2.2 STEP 2.2 – SELECTION OF EXPERTS

In order to form a representative respondent group a list of experts in the field of shared cars and/or mobility hubs was provided by AT Osborne. Next, to ensure a view from different angles the interviewees were selected from this list based on their role regarding the implementation of mobility hubs (that offer shared cars) in the Netherlands. Therefore, the interviewed group exists of experts working at: a shared car provider; a MaaS developer and exists of policy makers in different Dutch governmental bodies. They all play a role in the implementation of mobility hubs in The Netherlands: policy makers provide guidelines for the layout and location of the hub; a provider is experienced with aspects that influence the adoption of a shared car and is needed to offer shared cars at a hub and the MaaS developers influence the adoption of the hub by making it digitally visible and they are researching case studies. With their combined knowledge they are a representative group regarding the research subject.

For each research project according to Bakker and Edwards (2012) “it depends” how many interviews are enough. For this research project it was chosen to conduct six interviews in total, as data saturation had been reached after the sixth interview (Figure.

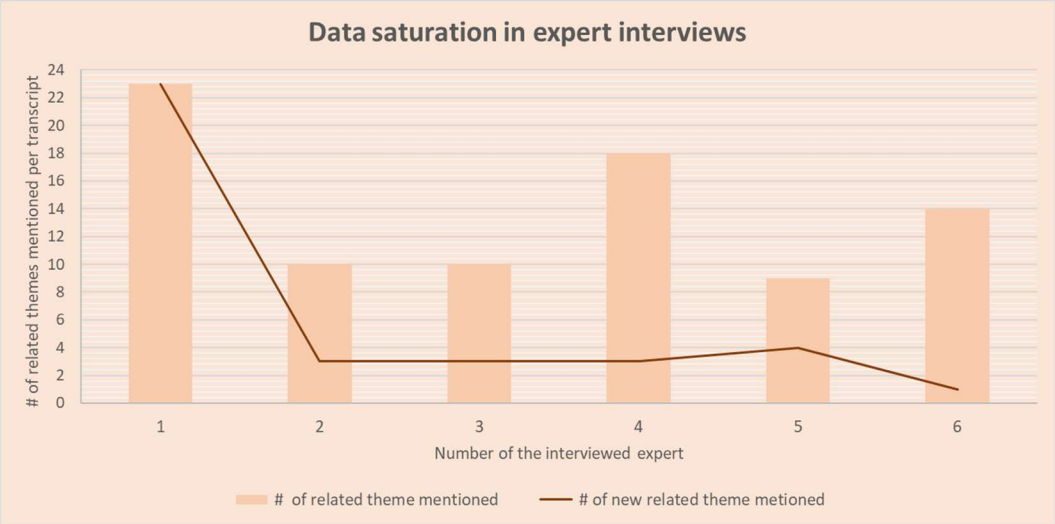


FIGURE 2-3 DATA SATURATION THEMATIC CONTENT ANALYSIS EXPERT INTERVIEWS

2.2.3 Step 2.3 - Setting up the interview

In this step agreements on practical issues are made including time, location, length of the interview, interview set up and permission has been asked to record the interview. Recording can improve the quality of the interview since the interviewer can concentrate on the answer more and does not have to solely rely on the notes (Spruijt, 2016).

2.2.4 Step 2.4 - Semi-structured interview

The form of the interviews was semi-structured (i.e. an interview which provides room to deviate from the interview questions and have a more casual conversation regarding the subject). A semi-structured interview contains open questions to prevent leading the answers in a certain direction, which could otherwise muddle the results. In addition, a semi-structured interview has the benefit, according to Adeoye-Olatunde and Olenik (2021), that it permits interviews to be focused while still giving the interviewer the chance to explore relevant ideas that may come up during the interview. See Appendix C for the question guide. During the interviews, notes were taken to derive the most important and relevant thoughts of the respondent (Spruijt, 2016).

2.2.5 Step 2.5 - Transcribing interviews and Thematic Content Analysis

Each interview was transcribed using either the transcribing service of Microsoft Teams or Microsoft Word. Transcribing seems a straightforward technique but is already the first step of data interpretation (Bailey, 2008). After the interview the most important quotes were highlighted. The highlights that are used in this study were checked and approved by the responders. See Appendix E for all the highlights. In this way the respondent is given the opportunity to check if the transcript is a correct representation of the interview or if the transcript contains any inaccuracies or unwanted sensitive statements (Spruijt, 2016).

Reoccurring themes in the transcripts are labelled and categorized using a Thematic Content Analysis (TCA). A TCA is used to analyse the data because experts could provide well-argued reasoning, but not facts from experience. The value of a TCA is that it makes it possible to systematically code and categorize large amounts of textual data in cases where there are no previous studies dealing with the phenomenon (Vaismoradi et al., 2013). For example, with the TCA themes are identified by bringing together components or fragments of ideas or experiences, which often are meaningless when viewed alone (Aronson, 1994, as cited in Nowell et al., 2017). This makes it possible to indicate a solution framework based on the statements of the experts.

In case a subtheme is mentioned by 5 or more experts it is considered that it has enough data to support it. This would indicate that it has a connection to the research objective. What this connection means for the role of a mobility hub is determined by analysing it in more depth. Therefore a description is made regarding all that has been mentioned with a connection to the subtheme. Based on this description a potential role for a mobility hub in the adoption of the shared cars located at the hub is suggested.

2.3 Step 3 - Single case study: mobility hub in Utrecht

With a case study the previously made theoretical relationships (in the literature study and expert interviews) can be questioned and new ones can be explored. In addition, a case study is the only way to collect the perspectives of residents and only by interviewing residents on location it can be ensured that the respondents live within a 350m radius from the mobility hub. With a single case study, the case can be studied in more depth to establish a high quality theory that is transferable to other cases (i.e. other mobility hubs). In addition, it is better to study a single case when studying a group of people (Gustafsson, 2017). Therefore, as a single case study interviews were held with residents in Utrecht who live nearby a mobility hub to answer *sub question 3: "Which aspects of a mobility hub could stimulate residents to use a shared car located at their nearby mobility hub?"*.

The specific mobility hub was selected as case study based on its function in the transportation system and the offered shared vehicles. The research area was based on the walking distance from and to the mobility hub and was therefore within a 350m radius from the hub. The structure of the interviews was semi-structured to capture the resident's genuine perspective on the subject. In total 54 responses were collected. Therefore the threshold of minimal respondents was exceeded, as it was determined beforehand that 50 respondents would be enough for a qualitative analysis.

2.3.1 STEP 3.1 – SINGLE CASE STUDY

For the single case study, the mobility hub called “Hub Max Pax Lux” has been selected, Figure 2-4. The hub is located in a residential area in Utrecht. The hub is connected to a bus line and offers four shared cars, next to electric shared bikes and an electric shared cargo bike. The hub is not located near a train station. Therefore, it is more likely that the shared car on this location will be used for a round-trip, in comparison to shared cars located at a train station which are more often used as a last mile solution. This gives the hub a round-trip nature. This mobility hub is therefore one of the few in the Netherlands that is in line with the used definition of a mobility hub within this research study. Therefore, the Hub Max Pax Lux in the municipality of Utrecht is selected as the single case study.

FIGURE 2-4 THE INFORMATION THAT IS PROVIDED BY THE DUTCH MUNICIPALITY OF UTRECHT REGARDING THE "HUB MAX PAX LUX"

The research area was within a radius of 350m from this hub, as the CROW (2021, Table 8.4/2) specifies that: people accept a walking distance of 100-350m to a shared car (Andringa, 2022). It was chosen to exclude areas outside this radius to prevent residents from considering the walking distance to the mobility hub as (only) barrier to use a shared car located there. This way other themes that could weigh in the decision-making process whether to choose for a shared car instead of a private car could be collected. The aim was to get the residents perspectives on the identified themes (in the extensive literature study and expert interviews) that could weigh in this process.

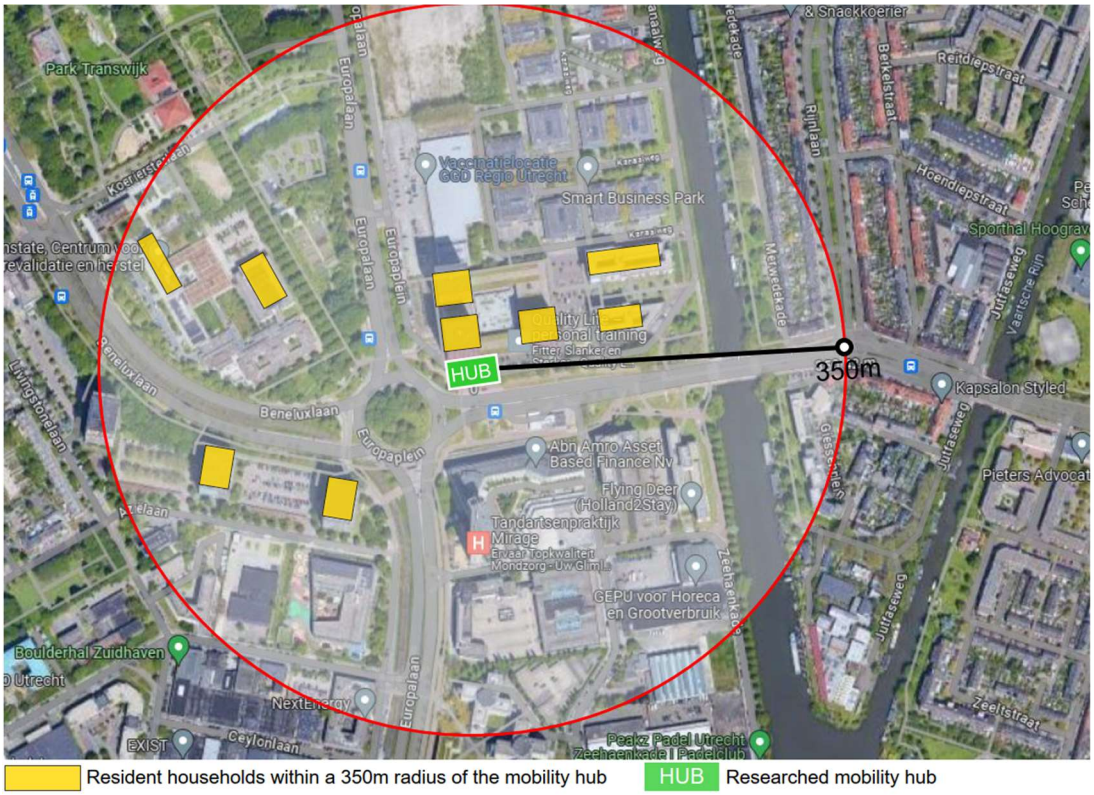


FIGURE 2-5 RESEARCH AREA (SOURCE: GOOGLE MAPS)

2.3.2 Step 3.2 – The interview structure

The interview started with an introduction of the topic and questions about their familiarity with the subject. Ideally the resident could answer the questions without having to explain the terminology to prevent it from leading their answers. After which closed questions were asked about some characteristics (e.g. how many private cars the resident's household owns) that seem to weigh in the decision-making process whether to choose for the use of a shared car. In the second part of the interview open questions were asked. These questions were used to get their genuine perspective on the subject (e.g. what the respondent thinks would stimulate them to use a shared car located at the mobility hub). See Appendix F for the interview guide.

It is considered that the use of a station-based shared car is perceived to be too expensive for people that structurally (e.g. 4 times a week) need a car to drive to a location where they spend a considerable part of the day (e.g. a working day) before driving back. In case they would use a shared car in that situation they would also pay for it during the time that the shared car is parked. This group is therefore not likely to be a potential user of a shared car. The majority of the people use a car for work and the regular workday is from 8:00 till 17:00. Therefore, the time of the survey was between 8:00 and 17:00 to reach as much of residents that could be potential users of a shared car. The interviews were held on working days between 27-11-2023 and 6-12-2023. The interview was either held on the spot or a QR-code to an online survey was given to the residents to fill in at a later more convenient time. Residents who did not have a driver's licence or were under the age of 18 year are excluded from the interviews, as they did not fit the profile of a potential user at that time.

Semi-structured interview

The interviews were semi-structured. Which made it possible to ask the residents about the identified themes while leaving room for conversation to not miss any relevant information regarding the subject. The questions were composed in such a way that they capture the perspective of the residents. The questions also test whether themes coming from the extensive literature study and expert interviews are deemed relevant by the residents as well. The open question captures the genuine perspective of the residents. The combination of closed and open questions is used to test whether themes coming from the extensive literature study and expert interviews are relevant for the residents as well. See Appendix G for all the answers that were provided by the residents.

Online survey

In case a resident had no time for the interview, a flyer with a QR-code to the interview questions was given to the resident. This online survey contained the same interview questions as the ones asked in person and left room for additional remarks to replicate the open questions in the semi-structured interview. See Appendix F for the online question guide.

2.3.3 Step 3.3 - Thematic Content Analysis

The responses have been analysed with a Thematic Content Analysis (TCA). A TCA is used to analyse the data because the residents often have no experience with the hub and answer in possible (future) scenarios. The value of a TCA is that it makes it possible to systematically code and categorize large amounts of textual data in cases where there are no previous studies dealing with the phenomenon (Vaismoradi et al., 2013). For example, with the TCA themes are identified by bringing together components or fragments of ideas or experiences, which often are meaningless when viewed alone (Aronson, 1994, as cited in Nowell et al., 2017). This makes it possible to indicate a solution framework based on the answers of the residents.

In case a subtheme is mentioned by 10% or more of the residents it is considered that it has enough data to support it. With a group size of 54 respondents this means that at least 5 residents will have to mention the subtheme. Which would indicate that it has a connection to the research objective. What this connection means for the role of a mobility hub is determined by analysing it in more depth. Therefore a description is made regarding all that has been mentioned with a connection to the subtheme. Based on this description a potential role for a mobility hub in the adoption of the shared cars located at the mobility hub is suggested.

3 FINDINGS IN EXTENSIVE LITERATURE REVIEW

This Chapter describes the findings in the extensive literature study based on the conducted Thematic Content Analysis (TCA), Chapter 2.1.4. In total 50 relevant articles have been collected and analysed with a TCA to answer *sub question 1: "Which aspects that are related to the use of a shared car could be influenced by aspects of a mobility hub?"*.

With the TCA reoccurring themes were identified that seem to weigh in the decision-making process whether to choose for a shared car. Initial themes eventually began to form into main-themes and subthemes (Appendix B). The main-themes are used throughout the research study to provide a structured comparison between the multiple TCAs. By analysing their influence, the subthemes are used to determine the guidelines a mobility hub has to fulfil in order to play a role in the adoption of shared cars located at the hub. Table 3-2 shows the identified main-themes and the subdivided themes that have been mentioned in 10% or more of the articles.

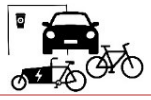
	MAIN-THEMES	SUBTHEMES
	**Financial aspects** (Paragraph 0)	*Not divided in subthemes*
	**Functional requirements** (Paragraph 3.2.2)	Accessibility Availability Safety
	**Personal requirements** (Paragraph 3.2.3)	Personal space
	**Aspects of the journey** (Paragraph 3.2.4)	Occasional needs
	**Attitude of potential users** (Paragraph 3.2.5)	Convenience Environmental concerns Flexibility
	**Psychological influence** (Paragraph 0)	Behavioural inertia
	**Challenging characteristics of potential users** (Paragraph 3.2.7)	Having a family with children Higher age Low technological affinity Perceived mobility needs Non-multimodal mindset Personal believes
	**Aspects of a mobility hub** (Paragraph 3.2.8)	Type of the shared cars offered

TABLE 3-1 OVERVIEW OF MAIN- AND SUBTHEMES

This is a combined result of research studies done within and outside of the Netherlands. The importance of these themes will be studied further by interviewing experts in the Netherlands (Chapter 4) and by conducting interviews with residents who live nearby a mobility hub in the Dutch municipality of Utrecht (Chapter 5).

3.1 Results from the Thematic Content Analysis

In total 50 relevant articles (N=50) were analysed using a Thematic Content Analysis (TCA). An overview of the results is found in Table 3-2, which shows the division of main-themes and all the related subthemes that have been mentioned in 10% or more of the articles. The complete result of the thematic content analysis can be found in Appendix H.

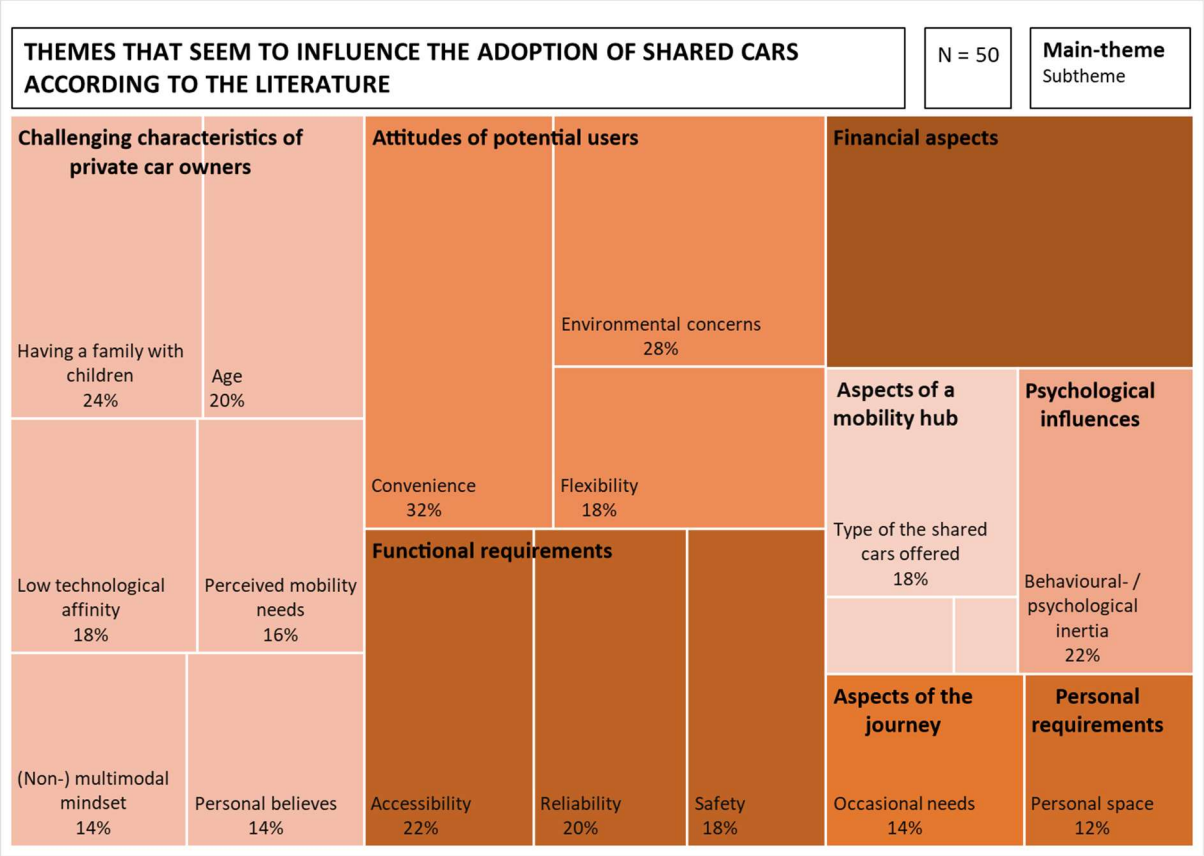


TABLE 3-2 OVERVIEW OF THE SUBTHEMES THAT HAVE BEEN MENTIONED IN 10% OR MORE OF THE ARTICLES

Several subthemes were mentioned in 10% or more of the articles. It is considered that these themes have enough data to support a connection with the research subject, Paragraph 2.1.4. This connection has been analysed in more detail in Paragraph 3.2. There, a qualitative description is made regarding all that has been mentioned about the subtheme. Based on this description a potential role for a mobility hub in the adoption of the shared cars located at the mobility hub is suggested.

3.2 Description and analysis of the reoccurring themes

In this Chapter, the main- and subthemes that have been found in the extensive literature study are described and analysed. A description is made regarding all that has been mentioned regarding each of the subthemes with a connection to the research subject. These descriptions are analysed and presented in short conclusions. Based on these conclusions, suggestions are made for the potential role of a mobility hub considering the influences of the subthemes.

3.2.1 FINANCIAL ASPECTS

Ikezoe et al. (2021) imply in their study that those who feel inconvenienced without a car also own a car because it is important to them, irrespective of the economic burden. However according to Liao et al. (2018), people do not necessarily use shared cars to replace private car trips even if it is slightly cheaper. Which suggest that financial aspects are not the only factor that weighs in their decision whether to use a shared car. For example, in the study of Jain et al. (2021) some respondents (who own a car and do not use shared cars) were aware that car ownership was more expensive in comparison to the use of shared cars, however they considered the ownership of a car as an essential expense. A respondent in this study said: ''I've always factored in all the costs. They are a part of my life. Since I am 18, that is what I would pay for my car every year". In addition, Jie et al. (2021) found that several studies are divided regarding income and the willingness to use shared mobility (e.g. shared cars). Some studies linked users of shared cars to low-income households. However, their research suggested something different: higher annual income leads to higher possibility of the respondents becoming a shared mobility user (Jie et al., 2021).

Some contradictions can be found in the literature Ikezoe et al. (2021) seem to suggest that financial aspects weigh the most in the decision-making process whether to use a shared car. However, the study by Jain et al. (2021) indicates that not only the costs but also behavioural inertia (e.g. tending to choose for an earlier used transport mode) and normative believes (e.g. a private car is a necessity) play a certain role.

3.2.2 FUNCTIONAL REQUIREMENTS

Several studies suggest that the presence of certain functionalities (i.e. functional requirements) weigh in the decision-making process whether to use a shared car. For example, in his research Van Rooij (2020) studied the perception of a mobility hub in the Netherlands amongst its respondents. The results show that the attributes (i.e. functional requirements) in Table 3-3 are of influence on the perception of the mobility hub in the respondent's neighbourhood. The attributes are listed from highest positive perceived attribute by the respondents to lowest according to the study by Van Rooij (2020).

From highest perceived attribute to lowest (Van Rooij, 2020)		**Corresponding subtheme in this research study**	**The connection between perceived attributes and the corresponding subthemes suggests the following order in subthemes (from highest influence to lowest).**	
01	Distance to the hub	Accessibility	01	Accessibility *
02	Diversity in vehicles	Flexibility	02	Diversity in vehicles
03	Sustainability of vehicles	Type of the cars offered	03	Type of the cars offered
04	Availability of vehicles	Availability	04	Availability *
05	Sustainability of the vehicles	Type of the cars offered	05	Visibility of the hub
06	Visibility of the hub	Visibility of the hub	06	State of the hub
07	State of the hub	State of the hub	07	Financial aspects
08	Hub costs	Financial aspects	08	Convenience
09	Ease of use	Convenience	09	Safey *
10	Safety of the hub	Safety	10	State of the vehicles
11	Safety of the vehicles	Safety	11	The hub's function in the transportation system
12	State of the vehicles	State of the vehicles		
13	Vehicle costs	Financial aspects		
14	Round trip nature of the hub	The hub's function in the transportation system		

TABLE 3-3 RANKING OF SUBTHEMES (* : FUNC. GUIDELINES THAT HAVE BEEN MENTIONED IN 10% OR MORE OF THE ARTICLES)

The literature seems to suggest that several subthemes related to "*functional requirements*" could influence the adoption of shared cars located at a mobility hub. When a subtheme is mentioned in 10% or more of the articles it is considered to be valued by the potential users of a mobility hub, Paragraph 2.1.4. Therefore, in this paragraph suggestions are made for the potential role of a mobility hub considering the influences of the subthemes:

- accessibility (e.g. regarding the walking distance to a shared car);
- availability (e.g. relating to the availability of shared cars);
- and safety (e.g. the feeling of social safety at a mobility hub).

ACCESSIBILITY IS MENTIONED IN 22% OF THE ARTICLES

The qualitative description below describes what has been mentioned by the literature regarding the subtheme *"accessibility"*. This description is analysed in Figure 3-1.

QUALITATIVE DESCRIPTION

The results in the study done by Liao et al. (2018) imply that the access time (i.e. walking distance) to one's own car influence the decision regarding whether to use a shared car and reduce car ownership. For example, respondents (who are carshare members) in the study by Jain et al. (2021) mention that in case the shared car is parked close by their home it replicates the key benefit of car ownership, which was for them not having to walk too far to access a car. However, other respondents (who were not a member of carsharing) described that walking to the closest shared car was inconvenient and they preferred a private car at their doorstep and believed that they did not have access to a shared car close enough to home, even though participants had a shared car available within a 10-minute walk of their home (Jain et al., 2021).

In addition, users of UbiGo (a shared car provider in Sweden) stressed that car sharing sites must be situated nearby if they are to use a shared car (Sochor et al., 2015, as cited in Durand et al., 2018. The analysis of UbiGo's extrapolated potential by Karlsson et al. (2017) found that such a service would mainly attract households in areas where public transport was readily available and with shared cars less than (approximately) 300m away (Durand et al., 2018). This 300m is within the range of the walking distance that people accept to a shared car according to the CROW (2021, Table 8.4/2).

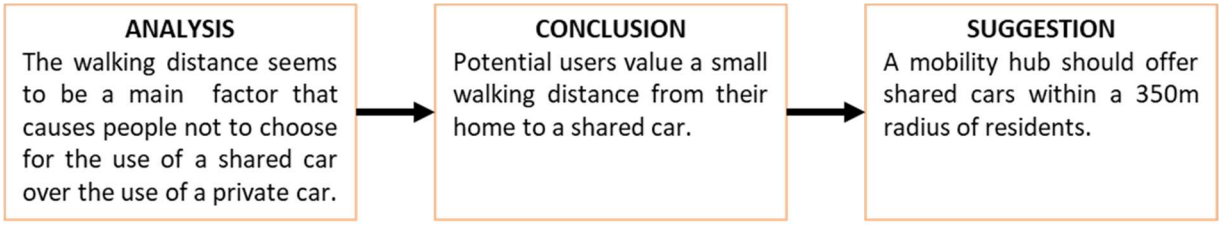


FIGURE 3-1 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "ACCESIBILITY"

AVAILABILITY IS MENTIONED IN 20% OF THE ARTICLES

The qualitative description below describes what has been mentioned by the literature regarding the subtheme *"availability"*. This description has been analysed in Figure 3-2.

QUALITATIVE DESCRIPTION

Respondents in the study by Jain et al. (2021) mentioned that even if they possessed the willingness to use a shared car, they did not consider it as a feasible option in case of low availability of shared cars in their neighbourhood. The respondents were afraid that there would not be a shared car near their house when they would need it. The convenience of having a car available in case of an emergency (i.e. a last-minute booking) was also highly valued by respondents in their study by. This strengthened by the study of Fioreze et al. (2019) in which respondents mention that their car gives them ease of use because it is always available. The research by Durand et al. (2018) concludes that when people use a shared mode of transport it is important for them not to compromise (too much) on their reliability demands. In addition, their study shows that there remains a high demand for reliability amongst potential adopters of MaaS.

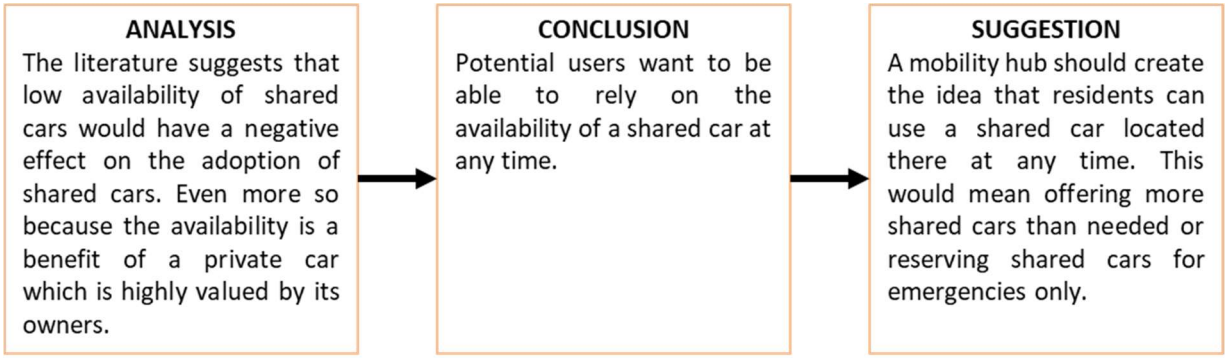


FIGURE 3-2 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "AVAILABILITY"

SAFETY IS MENTIONED IN 20% OF THE ARTICLES

The qualitative description below describes what has been mentioned by the literature regarding the subtheme *"safety"*. This description has been analysed in Figure 3-3.

QUALITATIVE DESCRIPTION

Safety is a very significant factor influencing the decision on the choice of the transport mode (Iseki & Taylor, 2010, as cited in Urbanek, 2021). For example, Wang et al. (2022) illustrate that safety concerns can prevent females from choosing shared modes of transport. Furthermore Van Rooij, (2020), found that attributes like safety of the hub influence the perception of his respondents regarding a mobility hub.

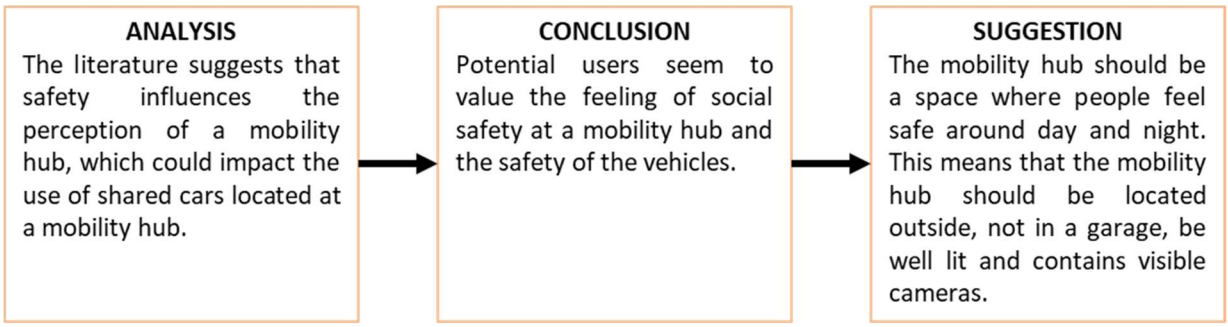


FIGURE 3-3 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "SAFETY"

3.2.3 PERSONAL REQUIREMENTS

The literature seems to suggest that several subthemes related to "*personal requirements*" could influence the adoption of shared cars. For example, large body of research indicates that there is a positive association between the sense of compatibility with the community and personal lifestyle and the adoption of shared mobility (Van Veldhoven et al., 2022).

When a subtheme is mentioned in 10% or more of the articles it is considered to be valued by the potential users of a mobility hub, Paragraph 2.1.4. Therefore, suggestions are made for the potential role of a mobility hub considering the influence of the subtheme:

- personal space (e.g. a driving a private car is seen as personal).

PERSONAL SPACE IS MENTIONED IN 12% OF THE ARTICLES

The qualitative description below describes what has been mentioned by the literature regarding the subtheme *"personal space"*. This description has been analysed in Figure 3-4.

QUALITATIVE DESCRIPTION

Overall, a private car is usually the preferred transport option, not only because of the convenience, but also because of the general enjoyment of its ''personal space" aspect (Alyavina et al, 2020). Which is why Paundra et al. (2017) found in their research that relinquishing one's car can be difficult, because people are often attached to their own cars, regarding them as "a place for me-time" and to "zone out" (Kent, 2015, as cited in Durand et al. (2018). For example, respondents in the study by Jain et al. (2021) mentioned that cleanliness and personal space were perceived as barriers to use a shared car.

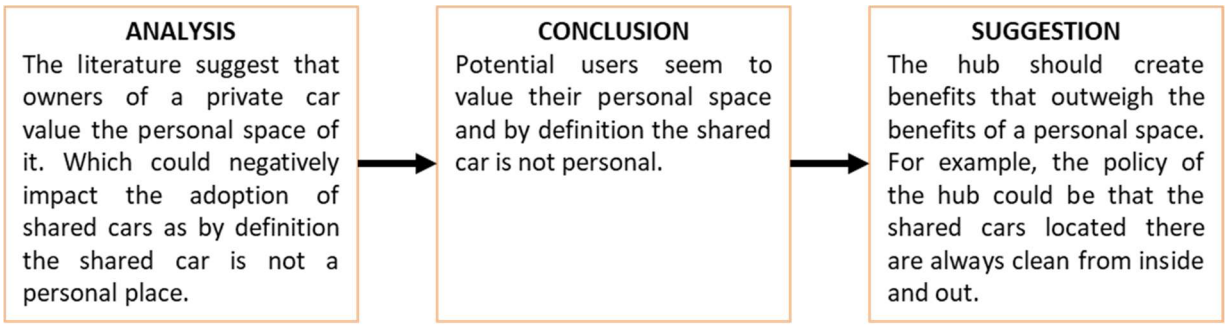


FIGURE 3-4 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "PERSONAL SPACE"

3.2.4 ASPECTS OF THE JOURNEY

The literature indicates that certain *"aspects of the journey"* determine whether the use of a shared car is seen as an option by travellers. For example, respondents in the study by Jain et al. (2021) mention that the process of using a car was inconvenient and required too much planning.

When a subtheme is mentioned in 10% or more of the articles it is considered to be valued by the potential users of a mobility hub, Paragraph 2.1.4. Therefore, suggestions are made for the potential role of a mobility hub considering the influence of the subtheme:

- occasional needs (e.g. a trip to the construction market);

OCCASIONAL NEEDS ARE MENTIONED IN 14% OF THE ARTICLES

The qualitative description below describes what has been mentioned by the literature regarding the subtheme *"occasional needs"*. This description has been analysed in Figure 3-5.

QUALITATIVE DESCRIPTION

In the study by Jain et al. (2020), respondents who claim to be car dependent make most of their trips by private cars and typically joined a car sharing scheme to meet a specific need at a point of time, such as moving furniture, or accessing a car when theirs broke down. Furthermore, the interviewed families in the study by Christensen et al. (2022) used a shared car for activities like carrying heavy items, shopping for large items or leisure activities, but not for fixed daily activities (e.g. commuting for work).

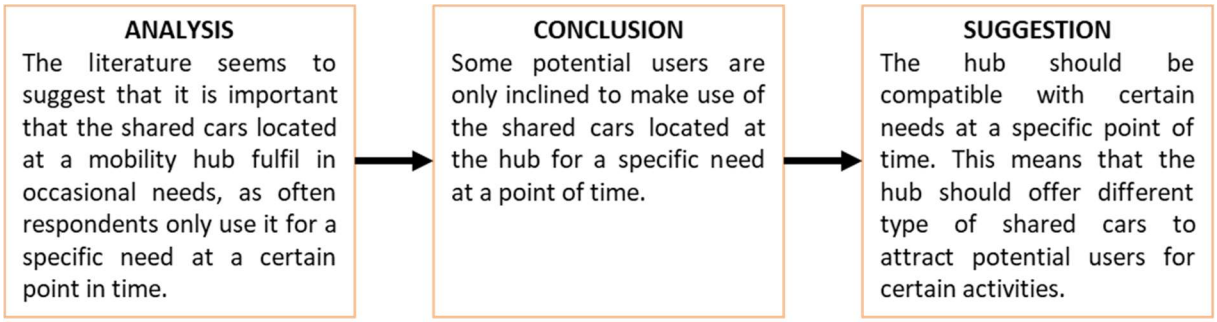
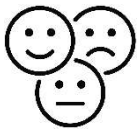


FIGURE 3-5 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "OCCASIONAL NEEDS"

3.2.5 THE ATTITUDES OF POTENTIAL USERS

Attitudes are generally considered to play an important role in travel behaviour (Ton et al., 2019). The finding in the study by Li and Zhang (2021) suggest that the more positive the *"attitudes of potential users"* towards carsharing are, the stronger the intention to make use of carsharing is. Attitudes cannot be measured directly, but this can be done by using indicators (Daly et al., as cited in, Arendsen, 2019). In the research of Li and Zhang (2021) they found that an individual's attitude toward carsharing was expressed by a comprehensive evaluation of five aspects: convenience; financial aspects; comfort; flexibility and environmental concerns.



When a subtheme is mentioned in 10% or more of the articles it is considered to be valued by the potential users of a mobility hub, Paragraph 2.1.4. Therefore, in this paragraph suggestions are made for the potential role of a mobility hub considering the influences of the subthemes:

- convenience (e.g. having a car at your doorstep);
- and environmental concerns (e.g. awareness of contribution to greenhouse gas emissions);
- and flexibility (e.g. being independent of timetables).

CONVENIENCE IS MENTIONED IN 32% OF THE ARTICLES

The qualitative description below describes what has been mentioned by the literature regarding the subtheme *"convenience"*. This description has been analysed in Figure 3-6.

QUALITATIVE DESCRIPTION

A form of convenience is that carsharing allows individuals to access a vehicle when needed without bearing the associated fixed costs (e.g. cost of insurance, maintenance, and long-term parking) (Circella, 2018). Moreover, car sharing members in the study of Jain et al. (2021) mentioned that if the shared car is closely located it replicated the key benefit of car ownership (i.e. not having to walk too far to access a car). While the convenience of a shared car, according to Circella (2018), can contribute to increasing car use among those individuals that do not feel the need to own a car, it also contributes to reducing the importance of car ownership among the other user (i.e. those that already own one or more vehicles).

Regarding the convenience of saving time, several authors indicated that adoption intentions were significantly higher for individuals who perceive shared mobility as a way to avoid congestion and thus saving time. It allows them for instance to have access to designated parking spots (Lindloff et al., 2014), to execute last and first-mile trips more efficiently (Sanders et al., 2020), and to avoid inefficient public transport (Van Veldhoven et al, 2022). In addition, for some respondents in the study of (Jain et al., 2021) convenience related to reduced ownership hassles (e.g. not having to worry about refuelling, cleaning or regular servicing).

However, in the study by Jain et al. (2021) their respondents' interpretation of ''convenience" varied by experience. For many, convenience was related to access. Respondents in this study who were not a member of carsharing schemes explained how the pre-booking and anxiety related to booking duration made car share feel less convenient than car ownership. Moreover, for many non-members inconvenience was related to the affective notion of freedom. Walking to the closest shared car was inconvenient for many non-members who preferred a private car at their doorstep, especially for people with children or mobility issues (Jain et al., 2021).

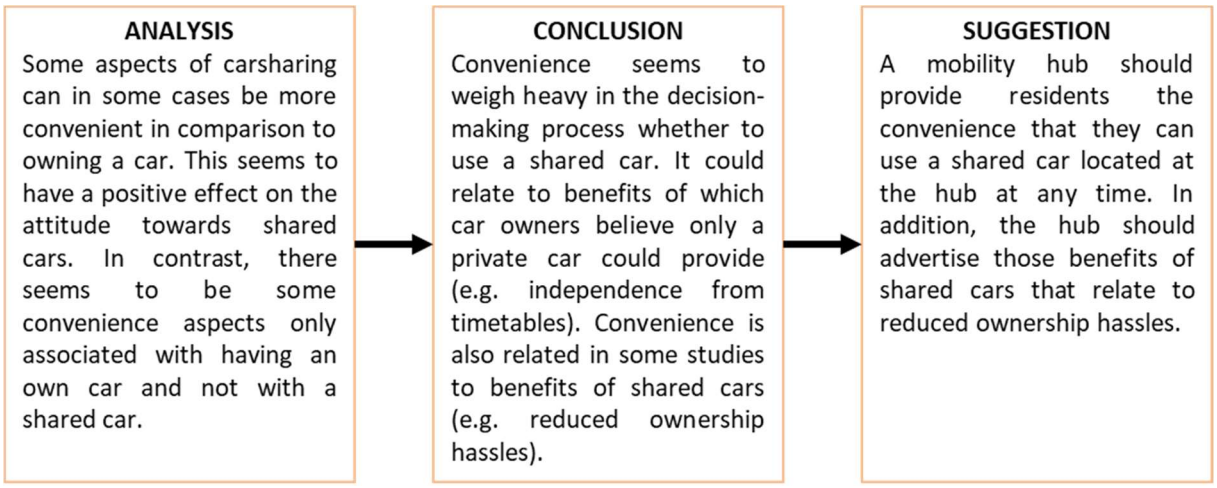


FIGURE 3-6 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "CONVENIENCE"

ENVIRONMENTAL CONCERNS ARE MENTIONED IN 28% OF THE ARTICLES

The qualitative description below describes what has been mentioned by the literature regarding the subtheme *"environmental concerns"*. This description has been analysed in Figure 3-7.

QUALITATIVE DESCRIPTION

Although the paper of Van Rooij, (2020) describes the theoretical potential user as someone who has a sustainable mindset, most research points in another direction. This is because in multiple papers carsharing is not perceived as a green transport mode. In the study by Aguilera-García et al. (2022) they observe that that higher environmental consciousness reduces individuals' carsharing usage. In the case of Madrid, pro-environmental attitudes had a negative impact on the adoption of carsharing, despite having a fully electric or plug-in hybrid shared car fleet (Aguilera-García et al., 2022). Moreover, the results in their study suggests that people with pro-environmental attitudes tend to prefer using more typical environmentally friendly transportation modes (such as active modes or public transport) rather than shared cars for their urban trips.

Therefore, climate morality (i.e. the personal norms to reduce the impact on the environment and the concern with it) is not affecting people's intention to use a shared car to a substantial extent (Ramos & Bergstad, 2021).

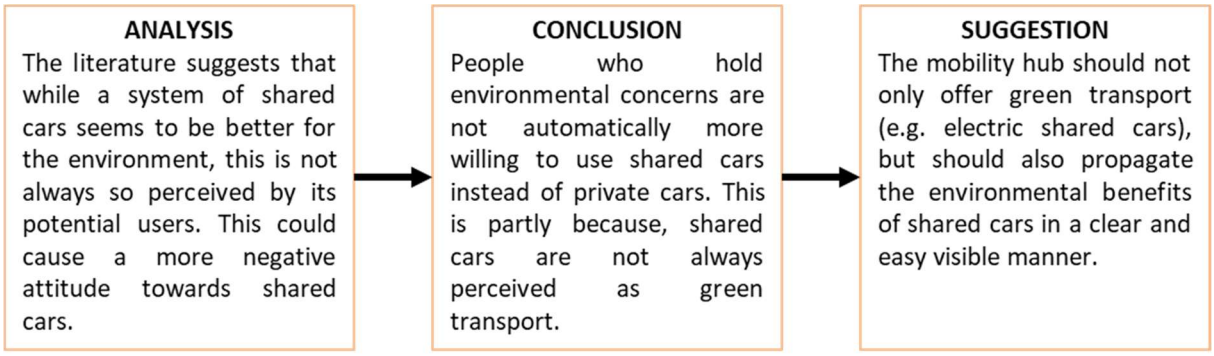


FIGURE 3-7 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "ENVIRONMENTAL CONCERNS"

FLEXIBILITY IS MENTIONED IN 18% OF THE ARTICLES

The qualitative description below describes what has been mentioned by the literature regarding the subtheme *"flexibility"*. This description has been analysed in Figure 3-8.

QUALITATIVE DESCRIPTION

Flexibility means being able to adapt to one's varying needs independent from time and space constraints (Durand et al, 2018). Cars are widely perceived as the only transport mode that gives people the autonomy and flexibility required to live a modern life (Freudendal-Pedersen, 2019, as cited in Durand et al, 2018). Privately owned cars are easily accessible at all times and can be used for different purposes. For some users, this means the possibility to transport tools and equipment while for others the opportunity to perform spontaneous trips. To become a suitable alternative, carsharing services need to offer a similar level of flexibility at a more affordable price (Cantelmo et al, 2022).

Regarding shared cars, a respondent in the study of Selzer and Lanzendorf (2022) mentions that carsharing requires a greater flexibility, organizational and planning know-how compared to driving a private car. Moreover, respondents associate car ownership and car driving with the meaning of relieving the burden of organizing daily family life. Consequently, according to some residents, car-free living is out of the question.

Studies towards MaaS schemes describe that shared mobility modes (e.g. shared cars) can provide flexibility and choice freedom in access-based systems, yet their flexible nature raises questions about reliability (Durand et al, 2018). Jain et al. (2021) says that shared car operators should increase information about this benefit to encourage potential users to try the system.

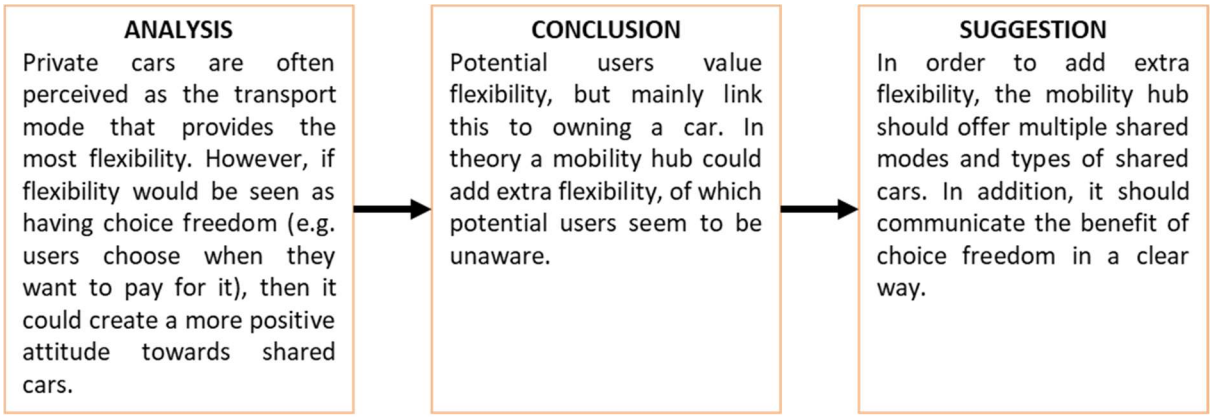


FIGURE 3-8 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "FLEXIBILITY"

3.2.6 PSYCHOLOGICAL INFLUENCES

Besides practical elements, the decision-making process of potential users is influenced by psychological aspects. For example, Ikezoe et al. (2021) describe that in some cases the emotional factors explain the motivation of car ownership more strongly than instrumental factors. The psychological influence that is identified in the extensive literature study is:

- behavioural inertia (e.g. people tend to prefer an earlier used transport mode);

The literature seems to suggest that several subthemes related to *"psychological influences"* could influence the adoption of shared cars. When a subtheme is mentioned in 10% or more of the articles it is considered to be valued by the potential users of a mobility hub, Paragraph 2.1.4. Therefore, in this paragraph suggestions are made for the potential role of a mobility hub considering the influence of the subtheme *"behavioural inertia"*.

BEHAVIOURAL INERTIA IS MENTIONED IN 20% OF THE ARTICLES

The qualitative description below describes what has been mentioned by the literature regarding the subtheme *"behavioural inertia"*. This description has been analysed in Figure 3-9.

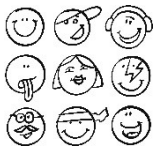
QUALITATIVE DESCRIPTION

The study by Gao et al. (2020) towards mode shift behaviour indicates that users of a private car with stronger psychological inertia are more likely to choose a previously used mode of transport. Their results show that psychological inertia plays an indispensable role in mode shift behaviour. For example, study by Ton et al. (2019) suggests that the mobility pattern of private car users is expected to be very challenging to change.

ANALYSIS	CONCLUSION	SUGGESTION
Getting travellers to at least try a shared car seems important, given that the literature suggests that travellers tend to choose for an earlier mode of transport.	It is likely that potential users rather choose for a mode of transport they have already used.	The mobility hub should specially make a first trip with a shared car attractive. How to do this would depend on the providers of shared cars and the facilities. For example, a facility at a hub could offer a discount (e.g. a free cup of coffee) when a user first uses a shared car there.

FIGURE 3-9 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "BEHAVIOURAL INERTIA"

3.2.7 CHALLENGING CHARACTERISTICS OF POTENTIAL USERS



The literature indicates that certain *"characteristics of potential users"* will make it more challenging to attract them to shared car use. For example, Ikezoe et al. (2021) mention that socio-economic factors, such as income, gender, age, and family composition, generally have a strong influence on car ownership and mode choice.

When a subtheme is mentioned in 10% or more of the articles it is considered to be valued by the potential users of a mobility hub, Paragraph 2.1.4. Therefore, in this paragraph suggestions are made for the potential role of a mobility hub considering the influences of the subthemes:

- having a family with children (e.g. walking to a shared car and having to install a child seat);
- higher age (e.g. they hold ownership in higher regard);
- low technological affinity (e.g. because booking a shared car is completely digital);
- perceived mobility needs (e.g. feeling the need to own a car for your work);
- non-multimodal mindsets (e.g. used to travel by car and not transfer between modes);
- and personal believes. (e.g. enjoying the ownership of a car).

HAVING A FAMILY WITH CHILDREN IS MENTIONED IN 22% OF THE ARTICLES

The qualitative description below describes what has been mentioned by the literature regarding the subtheme *"having a family with children"*. This description has been analysed in Figure 3-10.

QUALITATIVE DESCRIPTION

Ikezoe et al. (2021) describe that, amongst other factors, family compositing generally has a strong influence on car ownership and mode choice. For example, Durand et al. (2018) mentions a study by (Karlsson et al., 2017) amongst UbiGo users (a shared car provider in Sweden) which suggests that households with at least two young children were less interested to use their service. Jain et al. (2021) describes the practical challenges of using a shared car with children (e.g. walk with children to the shared car location, carry and safely install child seats, cleanliness and punctuality). In addition, the results in their showed that particularly people with children had higher perceived mobility necessities (PMN). These households are less likely to reduce their vehicle holdings, as more vehicles are needed to fulfil their mobility demand (Zhou et al., 2020).

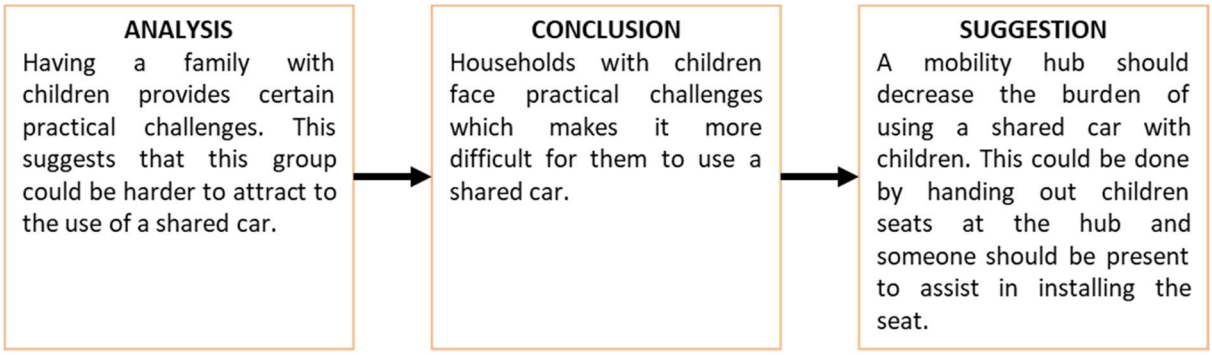


FIGURE 3-10 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "HAVING A FAMILY WITH CHILDREN"

AGE IS MENTIONED IN 20% OF THE ARTICLES

The qualitative description below describes what has been mentioned by the literature regarding the subtheme *"age"*. This description has been analysed in Figure 3-11.

QUALITATIVE DESCRIPTION

Regarding younger age, Amirnazmiafshar and Diana (2022) found in their literature study 23 articles that describe that the majority of shared car users are young people, of which 12 articles made it more specific by stating that this group is between mid-20 and mid-30.

Regarding higher age, older generations may find it more difficult to relinquish the traditional ownership model and generally may be more hesitant to embrace innovative services (Spickermann et al., 2014, as cited in Durand et al., 2018). This generation likely perceive a car as more than a tool (Lee et al, 2019), and their somewhat lower technology capabilities may be a hindrance in the usage of new modes of transport (González et al, 2020).

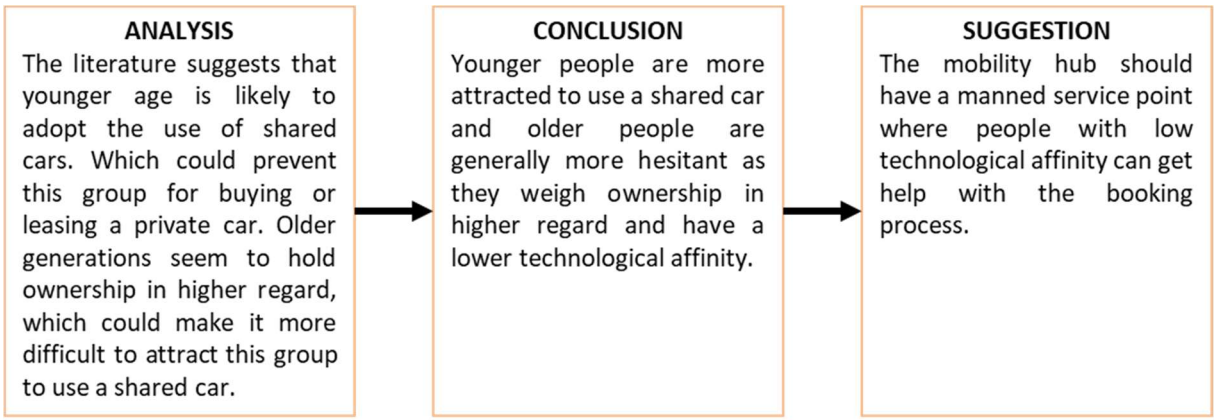


FIGURE 3-11 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "AGE"

LOW TECHNOLOGICAL AFFINITY IS MENTIONED IN 18% OF THE ARTICLES

The qualitative description below describes what has been mentioned by the literature regarding the subtheme *"low technological affinity"*. This description has been analysed in Figure 3-12.

QUALITATIVE DESCRIPTION

The ability to use smartphones is a required skill for using a shared car, as the entire process of using carsharing is completely dependent on smartphones, including locating vehicles, navigating, parking, paying for them, and so on (Li and Zhang, 2021). Therefore, the intention to use shared transport is found higher for people with higher levels of digital skill (Horjus et al., 2022). Which is indicated by the study of González et al. (2020) who mentions the lower technological capabilities of its respondents of higher age to be a hindrance in the use of new modes of transport (e.g. shared cars).

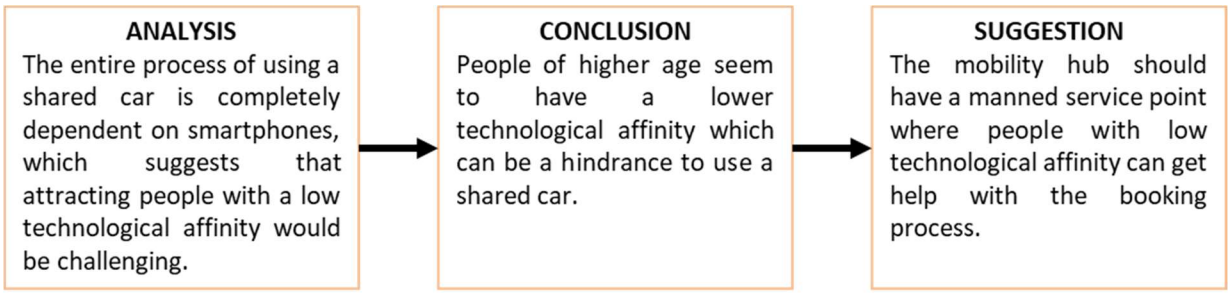


FIGURE 3-12 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "LOW TECHNOLOGICAL AFFINITY"

PERCEIVED MOBILITY NEEDS ARE MENTIONED IN 16% OF THE ARTICLES

The qualitative description below describes what has been mentioned by the literature regarding the subtheme *"perceived mobility needs"*. This description has been analysed in Figure 3-13.

QUALITATIVE DESCRIPTION

The study by Jain et al. (2020) categorised some of their respondents as car dependents. These car dependents have lifestyles and mobility needs which, in their perception, necessitated car ownership (Haustein and Hunecke, 2007, as cited Jain et al. (2020). These are considered to be perceived mobility needs (PMN). This car dependence is a state where a person feels they cannot do without their car and undertake most of their journeys using one (Brindle, 2003, as cited in Jain et al, 2020).

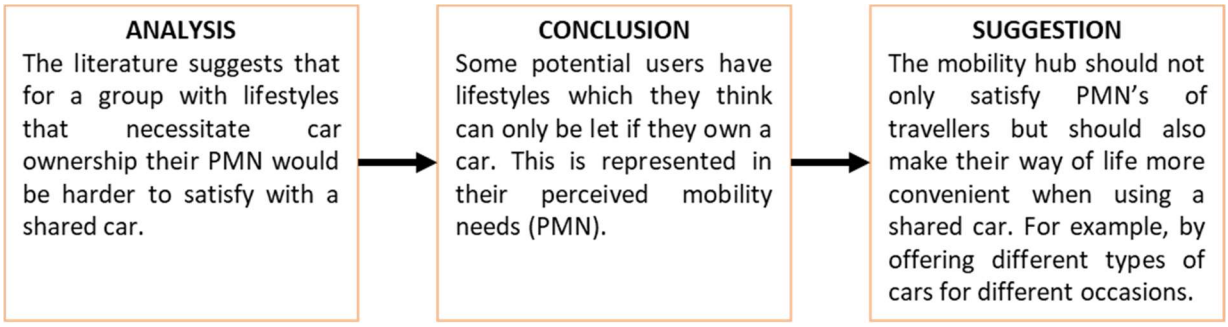


FIGURE 3-13 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "PERCEIVED MOBILITY NEEDS"

NON-MULTIMODAL MINDSET IS MENTIONED IN 14% OF THE ARTICLES

The qualitative description below describes what has been mentioned by the literature regarding the subtheme *"non-multimodal mindset"*. This description has been analysed in Figure 3-14.

The study of Lopez-Carreiro et al. (2021) towards the adoption of MaaS showed that potential users with unimodal behaviours seemed less open to shared mobility services (e.g. shared cars). This is strengthened by Horjus et al. (2022) who found that the intention to use shared transport is found higher by potential users who already use multiple means of transport during their trip.

ANALYSIS	CONCLUSION	SUGGESTION
People with a unimodal travel behaviour seem less open to use shared mobility. This suggests that travellers with a non-multimodal mindset will also be less likely to use shared cars.	Potential users who have a non-multimodal mindset will be harder to attract to shared car use.	Flanking policies and a good connection at the hub to public transport should stimulate multimodal travel behaviour. In addition, the mobility hub should inform that using a shared car offers the convenience of a unimodal trip.

FIGURE 3-14 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "NON-MULTIMODAL MINDSET"

PERSONAL BELIEVES ARE MENTIONED IN 14% OF THE ARTICLES

The qualitative description below describes what has been mentioned by the literature regarding the subtheme *"personal believes"*. This description has been analysed in Figure 3-15.

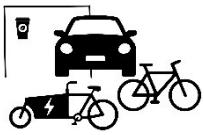
QUALITATIVE DESCRIPTION

Respondents in the study by Paijmans and Pojani (2021) are able to drive, have sufficient income to purchase and maintain a car, and yet they have chosen to live car-free. Also some of the respondents in this study believe that car ownership is unnecessary if you make certain practical adjustments. In addition, Redman et al. (2013) suggest in their study that individual perceptions, motivations and contexts are most effective in attracting car users to public transport. On the other side, related research has shown that cars are widely recognised as a status symbol (Jain et al., 2021).

ANALYSIS	CONCLUSION	SUGGESTION
There are some personal believes that make it more difficult to attract potential users. However, according to Redman et al. (2013) they also provide an opportunity.	It seems that individual perceptions have a large effect in the decision-making process whether to use a shared car.	The mobility hub should advertise those benefits that would resonate with the personal believes of the residents. It has to be taken into account that these could be different per neighbourhood.

FIGURE 3-15 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "PERSONAL BELIEVES"

3.2.8 ASPECTS OF A MOBILITY HUB



The literature provides several definitions of a mobility hub. The most mentioned characteristic is that it provides access to many transportation modes, such as public transportation, bike sharing, bus rapid transit (BRT), metro or car sharing, to enable travellers to become more mobilized (Aydın et al., 2022). Furthermore, the literature suggests that a mobility should satisfy the guidelines of the residents to live up to their potential (Claasen, 2020).

When a subtheme is mentioned in 10% or more of the articles it is considered to be valued by the potential users of a mobility hub, Paragraph 2.1.4. Therefore, in this paragraph suggestions are made for the potential role of a mobility hub considering the influence of the subtheme:

- Type of shared cars offered (e.g. relating to model size and fuel type).

TYPE OF SHARED CARS OFFERED IS MENTIONED IN 18% OF THE ARTICLES

The qualitative description below describes what has been mentioned by the literature regarding the subtheme *"type of shared cars offered"*. This description has been analysed in Figure 3-16.

QUALITATIVE DESCRIPTION

A participant in the study of Jain et al. (2020) mentioned that he needs his pick-up truck for work but uses occasionally a shared car to access a smaller vehicle. Further examples are mentioned by another group of respondents in their study, for example they typically joined car share to meet a specific need at a point of time (e.g. moving furniture or accessing a car when their broke down). Moreover, Liao et al. (2018) state in their article that many carsharing users still keep their private car and use carsharing services when their car is not available at the ideal time (e.g. because their partner is using the car).

According to the study of Liao et al. (2018), when electric vehicles are deployed in the carsharing fleet, the potential benefits of carsharing are further enhanced. However, Aguilera-García et al. (2022) observe in their study that car sharing is not perceived as a green transport mode, despite having a fully electric or plug-in hybrid shared car fleet. In their study, Jain et al. (2021) found that people feel more excited about using a shared car that is better or more expensive than a private car. However, the respondents mentioned as well that it would not be enough of giving up the convenience of having an own car.

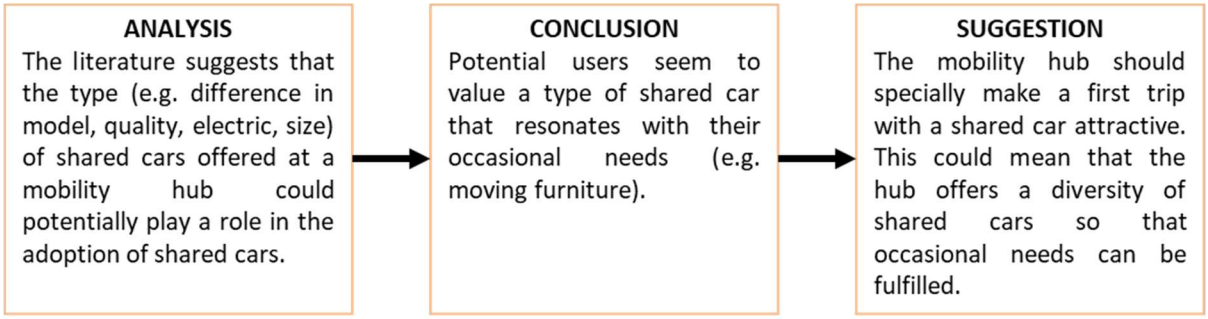


FIGURE 3-16 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "TYPE OF SHARED CARS OFFERED"

3.3 CHAPTER SUMMARY

Findings in the literature study suggest that the main-themes in Table 3-1 weigh more in the decision-making process whether to use a shared car in comparison to other factors: financial aspects; functional requirements; personal requirements; aspects of the journey; attitude of potential users; psychological influences; and challenging characteristics of potential users. The results of the extensive literature study is subdivided under these main-themes in Table 3-4.

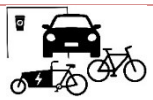
		
Financial aspects	**Functional requirements**	**Personal requirements**
• Seems to weigh the most in the decision-making process whether to use a shared car • People do not necessarily use shared cars to replace private car trips even if it is slightly cheaper	• The minimal requirements for a mobility hub to attract potential users • Potential users value: – small walking distance; – availability of a shared car at any time – feeling of social safety at a hub	• Amongst the personal requirements personal space seems to weigh the most in the decision-making process whether to use a shared car
		
Aspects of the journey	**The attitude of potential users**	**Psychological influences**
• Some potential users are only inclined to make use of the shared cars located at the hub for a specific need at a point of time	• Potential users with a positive attitude towards shared cars seem to be more willing to use it • Some value convenience regarding being independent of timetables, others regarding the reduction of ownership hassles • Potential users value flexibility, but mainly link this to owning a car • In theory a mobility hub could add extra flexibility, of which potential users seem to be unaware	• In some cases the emotional factors explain the motivation of car ownership more strongly than instrumental factors • It is likely that potential users rather choose for a mode of transport they have already used
		
Challenging characteristics of potential users		**The potential value of mobility hubs**
• Households with children face certain practical challenges • People with a higher age are generally more hesitant as they weigh ownership in higher regard and have a lower technological affinity • Some potential users have lifestyles which they think can only be let if they own a car • If potential users have a non-multimodal mindset they will probably be harder to attract to use shared cars • It seems that individual perceptions could be most effective in attracting private car owners to the use of shared cars		• The role of mobility hub is mainly seen as something that could provide parking convenience in case of flanking policies • Potential users seem to value a type of shared car that resonates with their occasional needs

TABLE 3-4 SUMMARY OF EXTENSIVE LITERATURE REVIEW

3.4 SUB CONCLUSION 1

Which aspects that are related to using of a shared car could be influenced by aspects of a mobility hub?
The choice whether to use a shared car is influenced by tangible factors, such as: financial aspects; functional requirements, aspects of the journey and aspects of a mobility hub and intangible factors, such as: the attitude of potential users, personal requirements, psychological influences and challenging characteristics of potential users are of influence. The relationships between these factors and shared car usage could be influenced by a mobility hub.

Findings in the literature suggests that **financial aspects** have a strong relationship with the use of a shared car, because 38% of the articles mention a link between financial aspects and the use of a shared car. The influence of financial aspect is not always in favour of the shared car because it can be perceived as a barrier. Therefore, the influence of financial aspects can be described as a direct causal relation with the use of a shared car, as suggested by the conceptual model in Figure 3-17. In addition, financial aspects are linked by Li and Zhang (2021) to **the attitude** towards shared mobility and could therefore also influence the willingness of potential users to use a shared car.

Functional requirements seem to largely influence shared car adoption and could be seen as the minimal requirements for the adoption of shared cars. For example, the walking distance to a shared car determines for potential users whether they would consider using it. This indicates that functional requirements have a direct causal relationship with shared car usage, similar to the conceptual model in Figure 3-17. Using a shared car decreases the personal space in comparison to the use of a private car. Travellers that value personal space could therefore see it as a barrier, which could prevent them from using a shared car. This suggests a causal relationship between such **personal requirements** and shared car usage in both directions as indicated in Figure 3-17.

The occasion of the trip seems to be the **aspect of the journey** that drives potential users to a shared car the most. For example, for some potential users there seems to be no need to use a shared car unless it is for a special occasion (e.g. a trip to the construction market). Therefore, such aspects of the journey have a direct causal relationship with shared car usage. In addition, shared car usage affects certain aspects of the journey, like the process of using a car. This relationship is indicated in the conceptual model in Figure 3-17. The **attitude of potential users** seems to depend mainly on how they experience convenience and flexibility, because these subthemes were mentioned by 10% or more of the reviewed articles, Paragraph 2.1.4. The attitude of potential users towards shared mobility seems to have an indirect effect on the use of shared cars. The attitude determines the **willingness** of potential users to use a shared car. Which suggests that, the willingness to use a shared car has a direct causal relationship with shared car usage, while the attitude influences this relationship, Figure 3-17.

Psychological influences could cause that travellers are more likely to choose for an earlier used transport mode. Whether travellers have used a shared car before therefore influences the potential use of a shared car, which suggests a direct causal relation, Figure 3-17. **Challenging characteristics of potential users** (e.g. low technological affinity) could influence the use of a shared car. For example, because the booking process is completely digital. Some characteristics could therefore have a causal relation with the use of shared cars, Figure 3-17. In addition, it could be that certain challenging characteristics of potential users (e.g. higher age) increase the need of certain functional requirements at a hub and therefore could influence this relation. This also indicates that certain **aspects of a mobility** hub have an influence on the relation between challenging characteristics of potential users and the use of shared cars, Figure 3-17. At the same time aspects of a mobility hub (e.g. the type of shared modes that it offers) could influence the aspects of the journey because it offer additional options of transportation.

The identified themes in seem to affect shared car usage, because they exceed one or more of the thresholds that are set in Paragraph 2.1.4, 2.2.5 and 2.3.3. These subthemes could therefore be independent variables that have a causal relationship with the use of shared cars (i.e. the dependent variable). This relationship could potentially be influenced by aspects of a mobility hub (i.e. moderator variables). Figure 3-17 represents an initial conceptual model to illustrate the relationships between the identified themes and shared car usage.

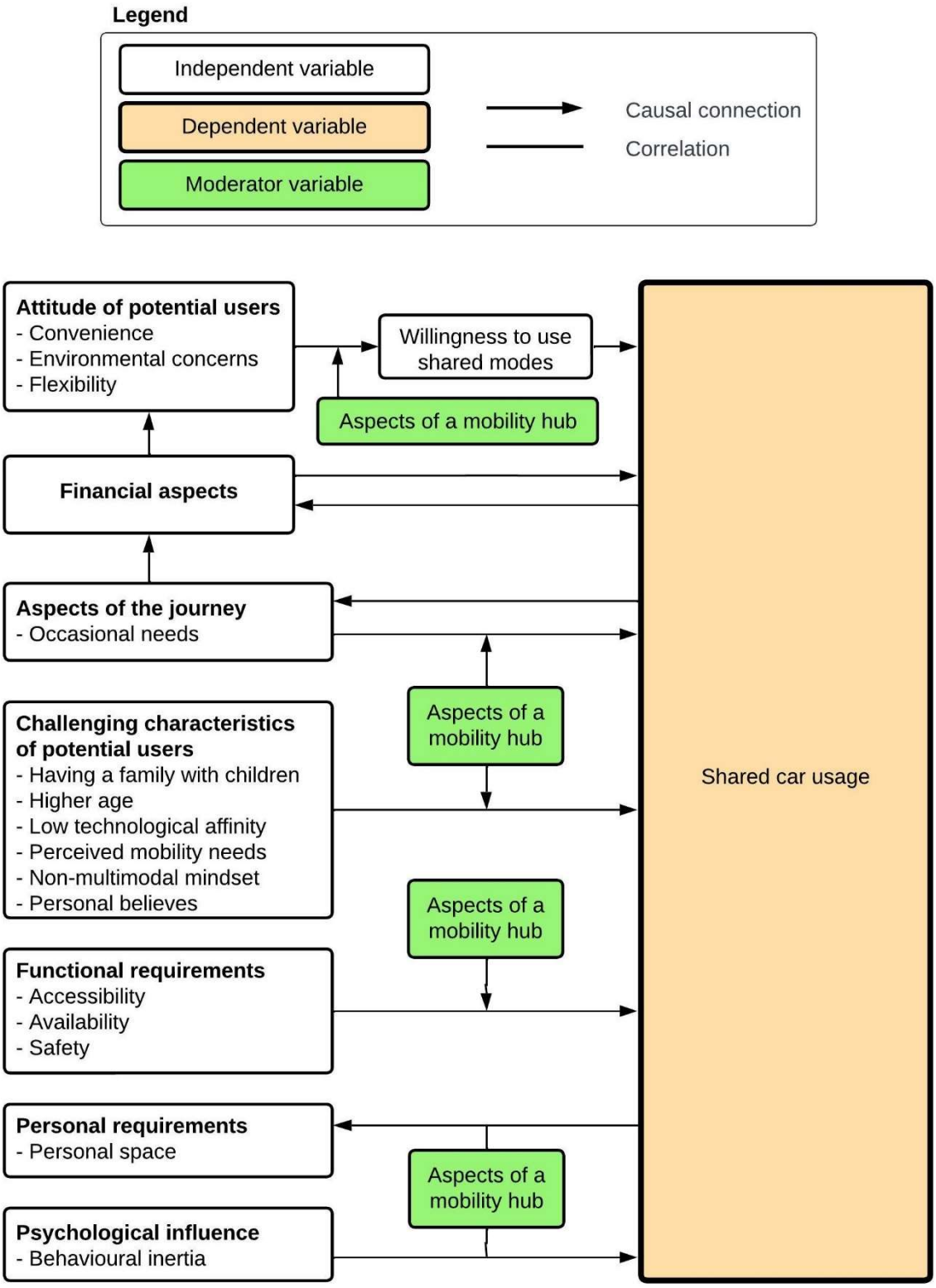


FIGURE 3-17 CONCEPTUAL MODEL SHOWING THE INFLUENCING FACTORS ON SHARED CAR USAGE BASED ON THE LITERATURE

3.4.1 Recommendations for policymakers and hub developers

Recommendations are made for guidelines regarding the layout of a mobility hub to influence the relationships between the identified themes and shared car usage. The guidelines are based on the identified subthemes, because these gave a more detailed understanding in comparison to the main-themes. The following guidelines are suggested with the goal to incentivize the use of shared cars located at a mobility hub:

A mobility hub should offer shared cars within a 350m radius of residents and create the idea that they can use a shared car located there at any given time (e.g. by offering more cars than needed). Residents also should feel safe at the hub, which could be established if the hub is located outside and be well lit. Furthermore, the hub should create benefits that outweigh the benefits of a personal space (e.g. offering a service to keep the shared cars clean) and be compatible with certain needs at a specific point of time (i.e. offering different type of shared cars). It should communicate this benefit of flexibility to its potential users in a clear and visible way (e.g. with an information sign). In addition, it should clearly advocate that shared cars present a more sustainable way of transport and present information about the booking process and costs. The mobility hub should also make a first trip with a shared car more attractive (e.g. with a free cup of coffee) and lower the barrier to use a shared car for families with children (e.g. by giving out child seats). For both the barriers would become even lower if there is someone present to help answering questions and assist in installing the child seats.

4 FINDINGS IN EXPERT INTERVIEWS

This Chapter describes the findings in the expert interviews based on the conducted Thematic Content Analysis (TCA), Paragraph 2.2.5. In total six interviews were held with experts in the domain regarding the development of mobility hubs in the Netherlands (see Table 4-1). These interviews have the aim to connect the theory to the practical. To support answering the main research question the interview questions were related to *sub question 2: "To what extend do mobility hubs and shared cars currently influence each other and is this reflected in the layout of hubs?"*.

# Respondent	Organisation	Key-role / function
Respondent 1	Ministry of Infrastructure and Water Management (I&W)	Responsible for subsidies for the development of mobility hubs in The Netherlands
Respondent 2	The municipality of Utrecht	Senior policy advisor regarding shared mobility and project leader in construction projects of mobility hubs
Respondent 3	Shared car provider	Coordinator of policies with politicians and official on the subject of shared cars
Respondent 4	Ministry of Infrastructure and Water Management (I&W)	Advisor on the subject of shared mobility at the Ministry of Infrastructure and Water Management
Respondent 5	Ministry of Infrastructure and Water Management (I&W)	Member of the department roads and travel safety and actively involved in the development of MAAS
Respondent 6	Arriva / Glimble	Responsible for the program of developing and experimenting with mobility hubs

TABLE 4-1 RESPONDENTS IN THE EXPERT INTERVIEWS

The reasoning of the experts is based on their background and expertise, and therefore well argued. Moreover, they all play a key role in the development of mobility hubs in The Netherlands. However, it must be noted that their reasoning is not based on actual facts or practical experience regarding to what extend a mobility hub can influence the adoption of shared cars located at the hub. Therefore, a TCA is used to analyse the transcripts. With the TCA themes are identified by bringing together components or fragments of ideas or experiences, which often are meaningless when viewed alone (Aronson, 1994, as cited in Nowell et al., 2017) and therefore make it possible to indicate a possible solution framework based on the statements made by the experts.

The insights derived from the extensive literature study were a subject in the interview questions to expand this knowledge. The form of the interviews was semi-structured (i.e. an interview which provides room to deviate from the interview questions and have a more casual conversation regarding the subject). Therefore the interview questions were open and not leading, yet several subthemes have been mentioned by 5 or more experts. Which therefore does indicate a solution direction. See Appendix C for the interview guide. After the interview the most important quotes were highlighted. See Appendix D for the results of all the highlights combined. Table 4-2 shows the identified main-themes and the subdivided themes that have been mentioned by 5 or more experts.

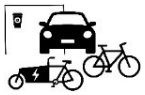
	MAIN-THEMES	SUBTHEMES
	**Financial aspects** (Paragraph 4.2.1)	*Not divided in subthemes*
	**Functional requirements** (Paragraph 4.2.2)	Visibility The hub's function in the transportation system Accessibility
	**Personal requirements** (Paragraph 4.2.3)	*No subthemes exceeded the threshold*
	**Aspects of the journey** (Paragraph 4.2.4)	*No subthemes exceeded the threshold*
	**Attitude of potential users** (Paragraph 4.2.5)	Convenience
	**Psychological influence** (Paragraph 0)	*No subthemes exceeded the threshold*
	**Challenging characteristics of potential users** (Paragraph 4.2.7)	*No subthemes exceeded the threshold*
	**Aspects of a mobility hub** (Paragraph 4.2.8)	Type of the shared cars offered The role of additional facilities

TABLE 4-2 OVERVIEW OF MAIN- AND SUBTHEMES

4.1 Results from the Thematic Content Analysis

In total six interview transcripts (N=6), Appendix E, were analysed using a Thematic Content Analysis (TCA). An overview of the results is found in Table 4-3 which shows all the themes that have been mentioned by five or more respondents. The complete result of the thematic content analysis can be found in Appendix H.

THEMES THAT SEEM TO INFLUENCE THE ADOPTION OF SHARED CARS ACCORDING TO THE EXPERTS	N = 6	Subthemes
Convenience		6
The hubs function in the transportation system		6
The role of additional facilities		5
Visibility		6
Accessibility		5
Type of cars offered		5

TABLE 4-3 OVERVIEW OF SUBTHEMES THAT HAVE BEEN MENTIONED BY MORE THAN 5 RESPONDENTS

Several subthemes were mentioned by 5 or more experts. It is considered that these subthemes have enough data to support a connection with the research subject, Paragraph 2.2.5. This connection has been analysed in more detail in Paragraph 4.2. There, a qualitative description is made regarding all that has been mentioned about the subtheme. Based on this description a potential role for a mobility hub in the adoption of the shared cars located at the mobility hub is suggested.

4.2 Description and analysis of the reoccurring themes

To compare the interview results with the extensive literature this paragraph describes what has been mentioned by the experts regarding the identified main-themes (Chapter 3) In case a subtheme is mentioned by five or more experts it suggests that it weighs more than others in the decision-making process whether to use a shared car. Therefore, the following subthemes are highlighted in addition to the main-themes:

- convenience (e.g. the convenience of being able to park at your doorstep);
- visibility (e.g. visibility of the hub and the shared cars at the hub);
- accessibility (e.g. relating to the walking distance and 24h accessibility);
- the function (e.g. whether there is a need to use of the mobility hub);
- type of cars offered (e.g. larger models for occasional needs);
- additional facilities (e.g. a postal office or coffee corner).

4.2.1 Financial aspects

According to respondent 4, 5 and 6 financial aspects play a role in the adoption of shared cars, and a notion is made that private car owners are often unaware of the total costs of ownership and therefore might be ignorant of the financial benefits a shared car could provide. Respondent 6 thinks that the awareness of the cost benefits amongst potential users could play a role in making the use of a shared car more attractive. He mentioned that a mobility hub could offer a place (e.g. a sign) to make people aware of these benefits. In addition, according to respondent 1 additional facilities are deemed to be important with respect to profitability of the hub. According to respondent 2, adding these facilities (i.e. postal services, coffee corners or small libraries) at a mobility hub are amongst the possibility, however this is seen as of secondary importance and are therefore in most cases not yet been realised. In addition, it could be beneficial for the sustainability of a mobility hub to leave room for up- or downscaling of the hub (respondent 6).

4.2.2 FUNCTIONAL REQUIREMENTS

Functional requirements have been mentioned quite a lot by the experts. One reason for this is that some see this as the minimal requirements a mobility hub should adhere to. The visibility of the hub and the shared cars; its function in the transportation system and the accessibility are indicated as the most important guidelines. Therefore, suggestions are made for the potential role of a mobility hub considering the influences of these subthemes.

VISIBILITY IS MENTIONED BY 5 EXPERTS

The qualitative description below describes what has been mentioned by the experts regarding the subtheme *"visibility"*. This description has been analysed in Figure 4-1.

QUALITATIVE DESCRIPTION

It is stated by respondent 3 that the visibility is an important factor regarding the adoption of the shared car by residents. This visibility would be less in case (existing) parking garages are transformed to mobility hubs. This last notion is supported by respondent 6, as he mentioned that the benefit of a shared car located on the side of the road is its visibility. In addition, respondent 4 and 6 mentions that a mobility hub, which offers facilities that make it a nice place to frequently reside, could attract potential users as this would increase the visibility and increase the awareness of the shared cars located there. This is important because the awareness amongst residents regarding the option of shared cars in their neighbourhood remains an important factor in the adoption of shared cars, according to respondent 4. A uniform style is developed to increase the recognisability of mobility hubs, respondent 2 thinks this will make a hub more attractive. However, whether this effect actually does occur still has to be researched. Respondent 5 makes the remark that besides physical visibility, it is important that a mobility hub is digitally visible (e.g. is shown on a MaaS-app).

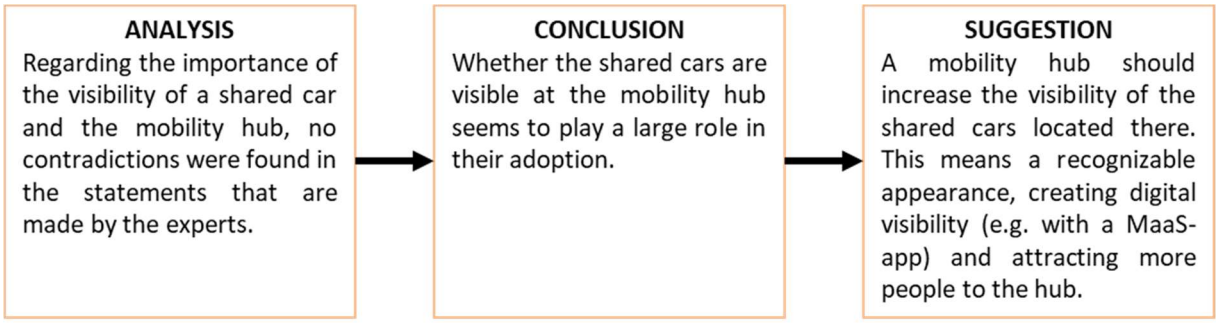


FIGURE 4-1 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "VISIBILITY"

THE HUB'S FUNCTION IN THE TRANSPORTATION SYSTEM IS MENTIONED BY 5 EXPERTS

The qualitative description below describes what has been mentioned by the experts regarding the subtheme *"the hub's function in the transportation system"*. This description has been analysed in Figure 4-2.

QUALITATIVE DESCRIPTION

According to respondent 1 and 4, the influence of attractiveness of a mobility hub on its adoption comes second in comparison to the need for the residents to use the hub. Therefore, the need to use a shared car at a mobility hub depends on the function the hub has in the transportation system. This function depends on the location of the mobility hub and the presence of flanking policies (e.g. parking restrictions) in the area. For example, the function of a mobility hub in a city centre is different from the function of a hub in rural areas, which therefore reflects on the usage of the shared cars located there (respondent 1). However, he acknowledges that the role of a mobility hub is changing and that in neighbourhoods with few parking places it probably will become the alternative of the second owned car. However, respondent 3 says that with their current strategy they do not need a mobility hub.

In addition, according to respondent 1 and 5 a mobility hub will only become successful with flanking policies such as parking restrictions or a prohibition of free-floating shared vehicles in the area. This is supported by respondent 4, 5 and 6. In addition, respondent 4 and 6, mentions that people will only start to use a mobility hub if they have a reason to do so. Respondent 6 calls this need the minimal condition for using a mobility hub and mentions that the stacking of functions (e.g. additional facilities) is of secondary importance. He also stipulates the hypothesis that potential users of a mobility hub would prefer not to transfer between modes of transport.

Given that the private car is a convenient way for such a unimodal journey, according to respondent 6, the use of a mobility hub depends on making this journey less convenient (e.g. with parking restrictions). In addition, he says that these people would probably prefer to switch with a great ease between transport modes once at a mobility hub (e.g. from bus to shared car).

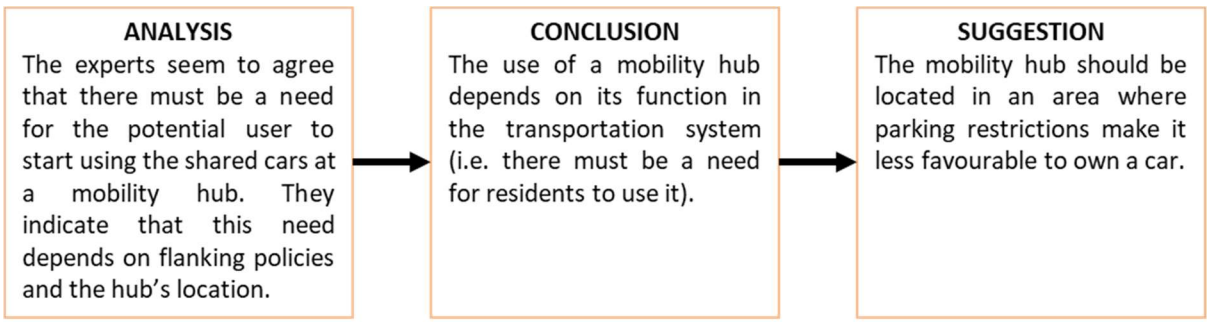


FIGURE 4-2 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "THE HUB'S FUNCTION"

ACCESSIBILITY IS MENTIONED BY 5 EXPERTS

The qualitative description below describes what has been mentioned by the experts regarding the subtheme *"accessibility"*. This description has been analysed in Figure 4-3.

QUALITATIVE DESCRIPTION

According to respondent 1, 2 and 4 when looking at the location of the mobility hub and the preferences of its potential users, the preference of a small walking distance is considered the most important. Unfortunately, according to respondent 2 the negative effect of a mobility hub is that the shared cars are less spread out through the neighbourhood which would cause for greater walking distances to a shared car. Regarding this, respondent 2 mentions that in this case it would be important to have good parking spots for bicycles. In addition, according to respondent 6 a shared car should replicate the freedom that a private car offers, which is that it is always available and at walking distance from their house. This convenience of a small walking distance is further stipulated by respondent 3, who also states that the shared car should be accessible 24 hours a day. Moreover, there should be no barriers (Dutch: slagbomen) and no doors to go through before reaching the shared car, because some should be able to get in and go, just like when they would use a private car (respondent 3).

The type of vehicle offered at a mobility hub determines to some extent the willingness of the potential user to walk a certain distance (respondent 2). For example, people are more willing to walk a larger distance to a shared car than they are to a shared bicycle. Respondent 4 suggests that, if a shared car is located at a closer distance in comparison to a shared car located at a hub, the walking distance remains the most important factor and not the possible additional benefits (e.g. facilities and services) at the mobility hub.

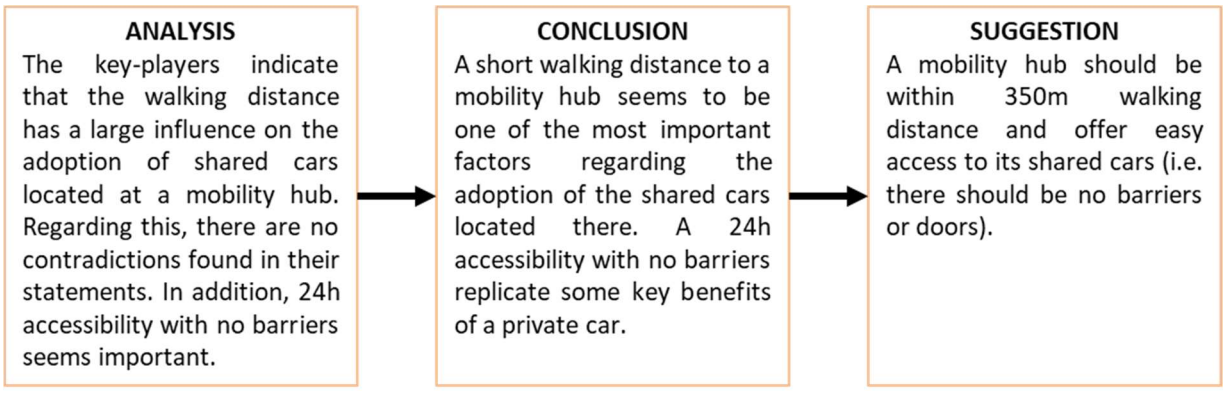


FIGURE 4-3 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "ACCESSIBILITY"

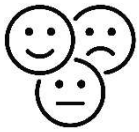
4.2.3 Personal requirements

Not much has been mentioned regarding this theme by the experts. The experts that did seemed to quite agree on this subject as there was little deviation in their answers considering this theme. For example, respondent 6 mentions that the potential users who are currently using their private car value the personal space of it.

4.2.4 Aspects of the journey

Respondents 3 and 6 think that the occasion (e.g. groceries or shopping at IKEA) sometimes determines the need for a shared car in case people do not own a car. In addition, the travel distance does influence the use of a shared car according to respondent 4, as she mentions that for short distances private vehicles are preferred as in comparison to larger distances a shared car would cost a lot.

4.2.5 The attitudes of potential users



In the literature study convenience was linked as an influential factor to the attitudes of potential users towards shared cars. While convenience was mentioned by six experts, it was linked by none to the attitude of potential users. Because this subtheme has been mentioned by six experts suggestions are made for the potential role of a mobility hub considering the influence of this subtheme.

Convenience is mentioned by 6 experts

The qualitative description below describes what has been mentioned by the experts regarding the subtheme *"convenience"*. This description has been analysed in Figure 4-4.

QUALITATIVE DESCRIPTION

It is assumed by respondent 1 that the user perceives convenience as an important component whether to choose for a certain mode of transport. For example, respondent 2 has considered to use a shared car, but the convenience of her own car outweighed each time the benefit of a shared car. This convenience would according to respondent 3 and 6 be (partly) based on the walking distance to the shared car and its 24-hour accessibility.

In addition, respondent 6 mentions the hypothesis that potential users of a mobility hub would prefer not to transfer between modes of transport. Given that the private car is a convenient way for such a unimodal journey, according to respondent 6, the use of a mobility hub depends on making this journey less convenient. An example mentioned for this by respondent 4, 5 and 6 is to restrict the parking spaces for private cars. In addition, these people would probably prefer to switch with a great ease between transport modes (e.g. from bus to shared car) once they are at a mobility hub (respondent 6). For this ease of use it might be beneficial to separate "fast" and "slow" traffic flows at the mobility hub, according to respondent 6.

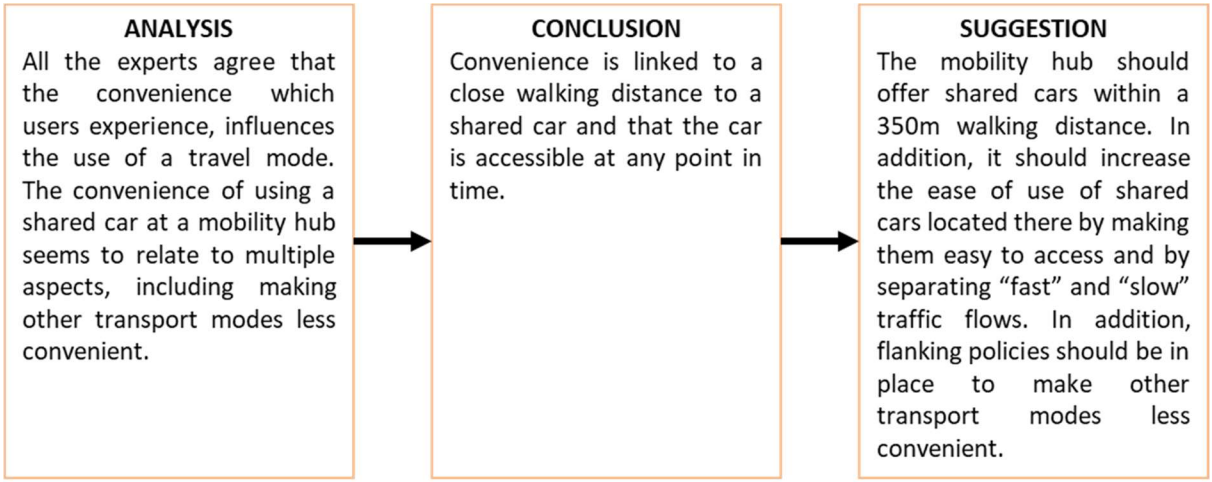
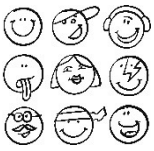


FIGURE 4-4 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "CONVENIENCE"

4.2.6 PSYCHOLOGICAL INFLUENCES

According to respondent 1, if people are unaware of the location of the shared car in their area and do not know how to use it they are often too reluctant to gain more information about it and instead will use the transport that they know, which would be their own car. In addition, respondent 6 mentioned that the potential users who are currently using their private car value the status it gives them. However, there is a large deviation between the given scores indicating the experts do not agree on its weight. According to respondent 4, getting people to at least try a shared car is an important first step in its adoption. This could be at moments that a potential user is in between cars (e.g. their private car is being repaired).

4.2.7 CHALLENGING CHARACTERISTICS OF POTENTIAL USERS

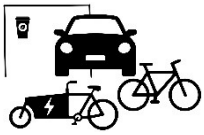


Respondent 1 mentioned that the location of the mobility hub is important as the usage of its additional services depend on it as well. So, if the mobility hub is located in a low-income neighbourhood the residents will not be drinking an expensive cup of coffee there (respondent 1). According to respondent 4, the users of private cars are often unaware of its accompanying total costs and therefore in some cases ignorant of the financial benefits a shared car could provide.

In addition, the unawareness amongst residents regarding mobility hubs plays a role in the adaption of hubs, according to respondent 1. For example, respondent 1 suggest that an important reason for people to be reluctant to use a shared car is the fact that they do not know yet whether they can rely on the availability of the shared car. Once a resident is aware of a mobility hub in its neighbourhood their attitude becomes an important factor in its adoption (respondent 1).

Regarding the subtheme “having a family with children”, respondent 1 shares his personal experience. He has not yet been a user of shared cars so far because of its family situation. However, as his family situation has now changed (i.e. his kids grew up) he is planning to switch their second car of the household far a shared car.

4.2.8 ASPECTS OF A MOBILITY HUB



The potential value of a mobility hub is not recognised by all the experts. The possibility to offer multiple types of shared cars at a mobility hub is identified as the biggest possible value of a hub. Therefore, suggestions are made for the potential role of a mobility hub considering the influence of this subtheme.

THE TYPE OF SHARED CARS OFFERED IS MENTIONED BY 5 EXPERTS

The qualitative description below describes what has been mentioned by the experts regarding the subtheme *“the type of shared cars offered”*. This description has been analysed in Figure 4-5.

QUALITATIVE DESCRIPTION

According to respondent 2 and 3 the offered vehicles at a mobility hub should be in line with the needs and preferences of its potential user, which are different in certain areas. Respondents 5 and 6 believed that offering different types of cars (e.g. sports car of a van) at a mobility hub could make it more attractive to use a mobility hub over owning your own car. According to respondent 5, this could even be a competitive element between owning a car and the use of a shared car located at a mobility hub. As additional benefit to a mobility hub (e.g. regarding the business case or the travel occasion), according to respondent 6, the hub could offer room for rental cars as well instead of offering only shared cars.

In contradiction, offering a diversity of shared cars at a mobility hub is not seen by respondent 4 (a shared car provider) as a benefit. That is, in case the shared cars are offered within walking distance of each other and can be located with a mobile app.

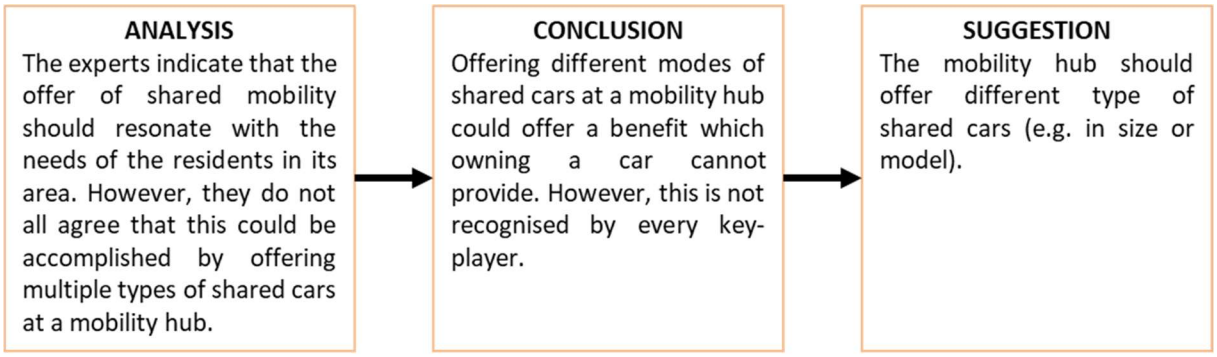


FIGURE 4-5 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "THE TYPE OF SHARED CARS OFFERED"

THE ROLE OF ADDITIONAL FACILITIES IS MENTIONED BY 5 EXPERTS

The qualitative description below describes what has been mentioned by the experts regarding the subtheme *"the role of additional facilities"*. This description has been analysed in Figure 4-5.

QUALITATIVE DESCRIPTION

Regarding the possibility of adding facilities to a mobility hub, respondent 4 could imagine that this would attract residents to the hub in case these facilities are not already available in the neighbourhood. Respondent 1, for example, assumed that it would be more attracting, in comparison to "gas" stations, for potential users to charge their electric vehicle at a mobility hub that contains facilities such as a postal service, a small drugstore, a dry-cleaning service or seats to meet (i.e. work-/ conference room). This would make the hub more attractive for potential users and is a key element for exploiters in case there are no paid parking places at that location (respondent 1). However, respondent 4 mentioned that in this case the residents would come to the mobility hub because of the facilities and not to travel with the shared car located there. This could however, according to 4, increase the chance of the residents using the shared car located at the mobility hub as this increases the visibility of the car as the residents are at the hub. For example, respondent 4 thinks that adding charging stations for private vehicles to a mobility hub could attract residents to come to the hub in case they experience difficulties with getting these stations in their own street.

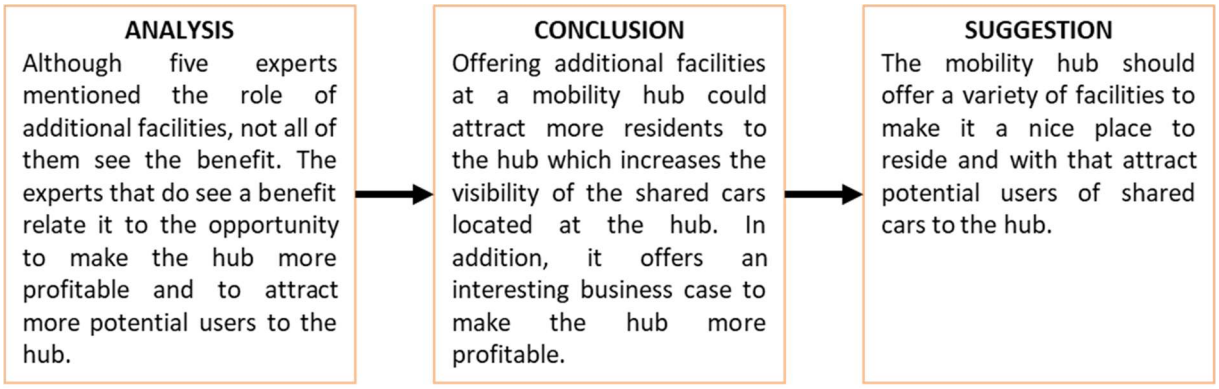


FIGURE 4-6 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "THE ROLE OF ADDITIONAL FACILITIES"

4.3 CHAPTER SUMMARY

Findings in the literature study (Chapter 3) suggested that the main-themes in Table 3-1 weigh more in the decision-making process whether to use a shared car in comparison to other factors. The findings in the expert interviews are subdivided under these main-themes in Table 4-4.

		
Financial aspects	**Functional requirements**	**Personal requirements**
• Car owners are often unaware of the total costs of ownership and therefore might be ignorant of the financial benefits a shared car could provide • Facilities could be important with respect to the profitability of the hub	• Some see this as the minimal requirements a mobility hub should adhere to • The visibility of the hub and the shared cars; its function in the transportation system and the accessibility are the main guidelines	• Potential users who are currently using their private car value the personal space of it
		
Aspects of the journey	**The attitude of potential users**	**Psychological influences**
• The occasion (e.g. groceries) could sometimes determines the need for a shared car in case people do not own a car • For short distances private vehicles are preferred as in comparison to larger distances a shared car would cost a lot	• Convenience is mentioned by six experts, it was linked by none to the attitude of potential users • Convenience would be based on the walking distance to the shared car and its 24h accessibility. • The use of a hub depends on making the journey by private car less convenient	• People who are unaware of the location of the shared car in their area and do not know how to use it are often are often too reluctant to gain more information about it and instead will use the transport that they know • Getting people to at least try a shared car is an important first step in its adoption
		
Challenging characteristics of potential users		**The potential value of mobility hubs**
• The location of the mobility hub is important as the usage of its additional services depend on it • Private cars are often unaware of its accompanying total costs • Unawareness amongst residents regarding mobility hubs plays a role in its adoption • Once a resident is aware of a mobility hub in its neighbourhood their attitude becomes an important factor • Having a family with children seems to make the use of a shared car inconvenient		• The potential value of a mobility hub is not recognised by all the experts • The offered vehicles at a mobility hub should be in line with the needs and preferences of its potential user, which are different in certain areas • In case a mobility hub would offer the possibility to make use of different type of cars, it could even be a competitive element between the ownership of a car and the use of a shared car located at a mobility hub • The hub could offer room for rental cars as well instead of offering only shared cars.

TABLE 4-4 SUMMARY OF EXPERT INTERVIEWS

4.4 SUB CONCLUSION 2

Sub question 2: To what extend do mobility hubs and shared cars currently influence each other and is this reflected in the layout of hubs?

The main influence of a mobility hub is to attract more potential users to hub by offering additional facilities and services. Increasing the potential users near a shared car could increase its visibility. This is not yet reflected in the layout of the hub, partly because whether residents make use of a mobility hub would mainly depend on the hub's function in the transportation system. The shared car offers an extra travel option at a mobility hub, which could attract more travellers to a hub and with that increase the visibility of other shared or public modes of transport.

The experts argue that the **convenience** has a strong causal relationship with shared car usage, as this relation has been mentioned by all six experts, which is in line with the conceptual model in Figure 3-17. In addition, they suggest that **decreasing the convenience of owning a private car** with flanking policies like **parking restrictions** could influence the perceived convenience of using a shared car. Using a shared car could offer better **parking convenience** in case a mobility hub offers a designated parking spot for it, closer to a household in comparison to a private owned car. Moreover, several experts believe that a mobility hub could play a role in the adoption of shared cars by providing **facilities and services** to make it more attractive to go there, which is an addition to the conceptual model in Figure 3-17. The role of additional facilities is not yet reflected in the layout of mobility hubs, because whether residents make use of a mobility hub would mainly depend on the hub's function in the transportation system. Moreover, the experts mentioned that the layout of the hub is of secondary importance.

Expanding the number of **potential users near a shared car** increases the **visibility** of a shared car. The experts indicate that the visibility of a shared car has a causal relationship to shared car usage, which is an addition to the conceptual model in Figure 3-17. This relationship is influenced by how many potential users are at a mobility hub, which in turn is influenced by providing additional facilities and services at a hub. It is not yet reflected in the layout of a mobility hub to actively attract more residents to a hub, however a uniform appearance has been developed to make hubs more recognizable.

The experts agree that the **type of shared cars** that are offered should be in line with the needs and preferences of the residents in the nearby area. Some experts see a mobility hub as the ideal place to offer a variety of shared cars, however the shared car provider argues that a mobility hub is not essential in this. Which could be a part of the reason why mobility hubs do not yet offer a variety of shared cars. According to the other experts (not the shared car provider), factors that could make it more attractive for providers to offer a shared car at a mobility hub (instead of free-floating or station based) are opportunities of extra profitability and increased attractiveness due to additional facilities or type of cars offered. A causal relationship between the type of shared cars that are offered at a hub and shared car usage could not be made at this point because the experts did not agree on its influence.

However, there are some experts who doubt that a mobility hub could play a role in the adoption of shared cars, because it all depends on whether there is **a need to use** a shared car. Therefore, the need to use has a causal relationship with shared car usage, which is an addition to the conceptual model in Figure 3-17. This relationship is influenced by **the hub's function in the transportation system**, which differs per **location** and depends on parking restrictions in its surrounding area. The hub's function in the transportation system is reflected by the variety of shared modes of transport it offers.

The experts think that a shared car could play a role in a mobility hub and define this role as an additional benefit to a place where people come together (e.g. stations). Therefore, offering shared cars at a mobility hub could attract more travellers to the hub. This influences the visibility of other shared or public modes of transport. Therefore, **offering shared cars at a mobility hub** could potentially have a causal relationship with the adoption of other shared or public modes of transport at the hub.

The downsides of offering shared cars at a mobility hub that should be considered are decreased **social safety**, increased **walking distances** and that it can be hard to make a hub **profitable**. In case potential users do not feel safe at a mobility hub it could prevent them from using shared cars at the hub. Social safety has therefore a causal relationship with the adoption of shared cars that are located at a mobility hub, which is in line with the conceptual model in Figure 3-17. Certain aspects of a mobility hub could influence this relationship, as explained

in Paragraph 3.4. For example, in case shared cars are offered at a mobility hub to replace station-based shared cars in the streets, it could increase walking distances to a shared car. Which is an important factor because the walking distance has a causal relationship with shared car usage, Figure 3-17.

4.4.1 Recommendations for policymakers and hub developers

In the transcripts of the expert interviews reoccurring themes have been identified. Recommendations are made for guidelines regarding the layout of a mobility hub to influence the relationships between the identified themes and shared car usage. The guidelines are based on the identified subthemes, because these gave a more detailed understanding in comparison to the main-themes. The following guidelines are suggested with the goal to incentivize the use of shared cars located at a mobility hub:

A mobility hub should increase the visibility of the shared cars located there. This means a recognizable appearance, creating digital visibility and attracting more people to the hub. Therefore, a mobility hub should offer a variety of facilities and services to make it a nice place to reside and attract potential users of shared cars. Furthermore, the mobility hub should be located in an area where parking restrictions make it less favourable to own a car and offer shared cars within a 350m walking distance. In addition, it should increase the ease of use of shared cars located there by making them easy to access (i.e. no doors and barriers) and by separating “fast” and “slow” traffic flows. Finally, the mobility hub should offer different types of shared cars to better fulfil occasional needs.

5 FINDINGS IN INTERVIEWS WITH RESIDENTS

This Chapter describes the findings in the interviews with residents based on the conducted Thematic Content Analysis (TCA), Paragraph 2.3.3. In total 35 interviews were held in person and 19 residents completed the online survey with the same questions, Appendix F. This results in a total response of 54 residents, Appendix G. The aim was to get the residents genuine perspectives on the identified themes (in the extensive literature study, Chapter 3, and expert interviews, Chapter 4) that could influence their decision-making process whether to use a shared car at the mobility hub. These insights support answering *sub question 3: "Which aspects of a mobility hub could stimulate residents to use a shared car located at their nearby mobility hub?"*.

5.1 CONNECTION TO REOCCURRING SUBTHEMES

Themes that seem to weigh in the decision-making process whether to choose for a shared car have been identified in the extensive literature study (Chapter 3) and the interviews with experts (Chapter 4). These results indicate that a mobility hub could play a role in incentivizing the use of shared cars located at the hub, when the subthemes in Table 5-1 are considered in its layout. Therefore, these have been included in the questions for the interviews with the residents. The interview guide can be found in Appendix F.

Convenience	Having a family with children	Personal believes
Flexibility	Higher age	Visibility
Safety	Low technological affinity	Occasional needs
Availability	Non-multimodal mindset	The hub's function in the transportation system
Accessibility	Perceived mobility needs	

TABLE 5-1 SUBTHEMES THAT WERE USED TO SET UP THE INTERVIEW GUIDE

5.2 RESULTS FROM THE THEMATIC CONTENT ANALYSIS

The thematic content in the answers that were provided by the residents during the interviews have been analysed in two-fold.

During the initial analysis three clusters of residents emerged based on the characteristics whether residents use a shared car at the mobility hub and whether they own a car, Figure 5-1. It was interesting to analyse these clusters in more depth, because due to the diverging characteristics between the clusters they reasoned from different perspectives. Therefore, these clusters have been analysed separately, Paragraph 5.2.1. The results of these analyses indicated relations between subthemes and the use of a shared car. However, these results could not be compared to the results of the extensive literature study and the expert interviews. This is because the subthemes that exceeded the threshold of 10%, Paragraph 2.3.3, were not representative due to the fact that smaller groups of residents were considered in these analyses. Therefore, a second analysis has been conducted considering all the collected data, Paragraph 5.2.2. This provided results that could be compared to the results of the extensive literature study and the expert interviews. This comparison is needed to determine whether the influence of a subtheme should be considered to be of primary, secondary or tertiary importance regarding the adoption of shared cars.

5.2.1 CONSIDERING THREE DIFFERENT CLUSTERS

A Thematic Content Analysis (TCA) has been conducted that considered specific groups (i.e. clusters) of residents. There is a group of nine (17%) of interviewed residents that have used a shared car at this mobility hub ("shared car users"). This is a considerable group and are therefore interesting to analyse further separately. The most mentioned reason by the others (83%) for not using a shared car at this mobility hub is that they own a car, however this is not the only reason mentioned. Therefore, it is interesting to analyse the reasoning of the group that owns a car ("non-user who own a car") separately from the group who do not own a car ("non-users who do not own a car"). Each cluster is of interest in this study, which is presented in Figure 5-1 and Table 5-2.

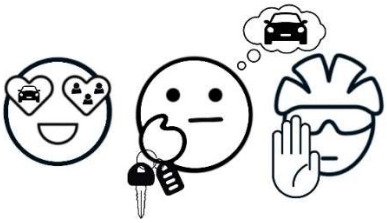


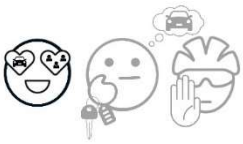
FIGURE 5-1 SHARED CAR USERS (LEFT); NON-USERS WHO OWN A CAR (MIDDLE); NON-USERS WHO DO NOT OWN A CAR (RIGHT)

Shared car users (N = 9)	Non-users who own a car (N = 21)	Non-users who do not own a car (N = 24)
They have a reason to use a shared car at the mobility hub. However, they did not become structural users.	They own a car, but would consider using a shared car at the mobility hub under certain circumstances.	They live nearby a mobility hub which offers the option to use a shared car. Although they do not own a car this group has not used a shared car at the hub yet.

TABLE 5-2 THREE GROUPS OF INTERVIEWED RESIDENTS

This Thematic Content Analysis (TCA) is done in two-fold or each cluster. Once considering the themes that seem to contribute in the decision to not use a shared car at the mobility hub; and once for the themes that seem to weigh in the consideration to use a shared car at the mobility hub. For the full result of the thematic content analysis see Appendix I.

CLUSTER 1 - SHARED CAR USERS



The group that had used a shared car at this mobility hub before gave different explanations for it. Everyone had in common that at the time they used the shared car they did not own a car (e.g. before they had the budget to buy a car) or their own car was unavailable at the moment (e.g. their own car was at the garage). What most had in common was that they had a certain need for a shared car that was bound to a specific point of time or occasion. Occasional needs regarded moving heavy stuff, weekend holidays or destinations unreachable by bike. There was one slightly structural user, who did not own a car, enjoyed driving and did not often have the need to use a car. The reasons why this group would or would not use a shared car are shown in Figure 5-4, if this reason was given by 10% or more of the residents in this group.

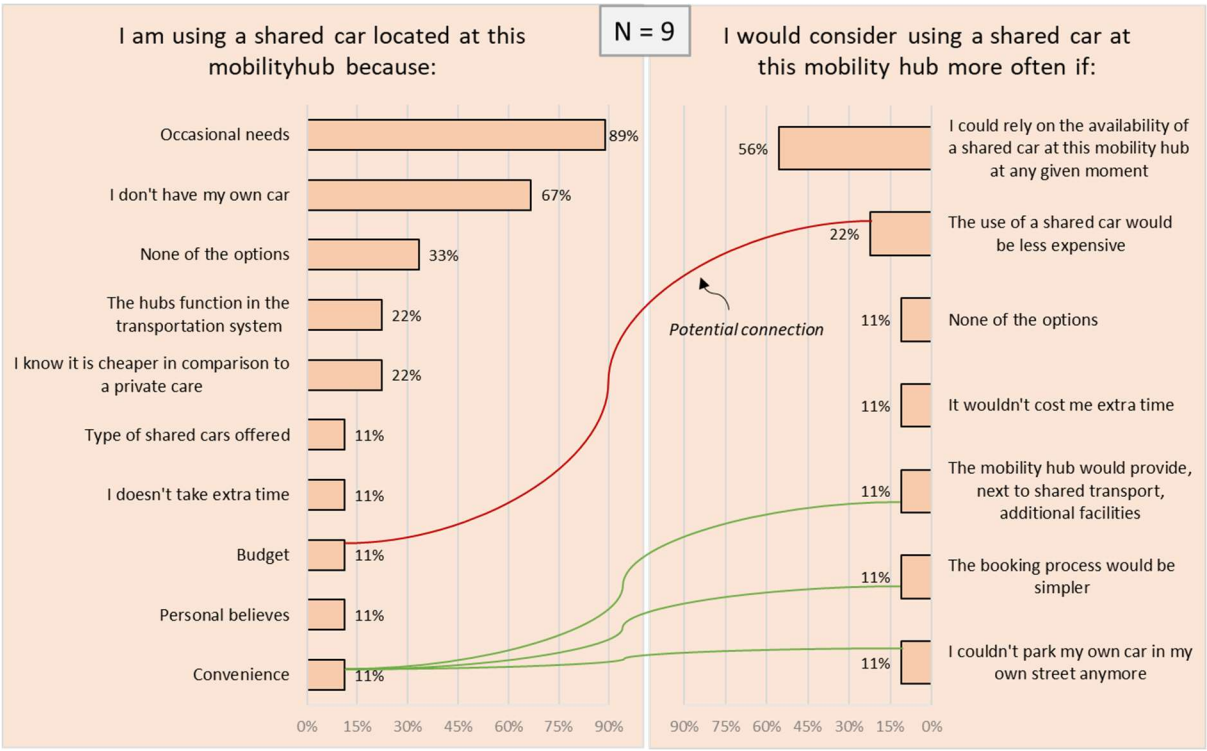


FIGURE 5-2 WHY RESIDENTS USED A SHARED CAR AT THE HUB COMPARED TO WHAT COULD INFLUENCE FUTURE USE

This figure shows that most of the time residents used a shared car because of occasional needs. These occasional needs did not lead to structural use of the shared cars at this hub. Most residents used a shared car out of need but were unhappy with the accompanied expenses. For example, one resident mentioned: "You are already paying around 30 euros for travelling a short distance. In this case you might as well rent a car for a whole day at a bigger company (e.g. Sixt)". Some residents (3 in total) would consider using a shared car more often if the hub would provide additional convenience (e.g. offer additional facilities, a simpler booking process and parking convenience).

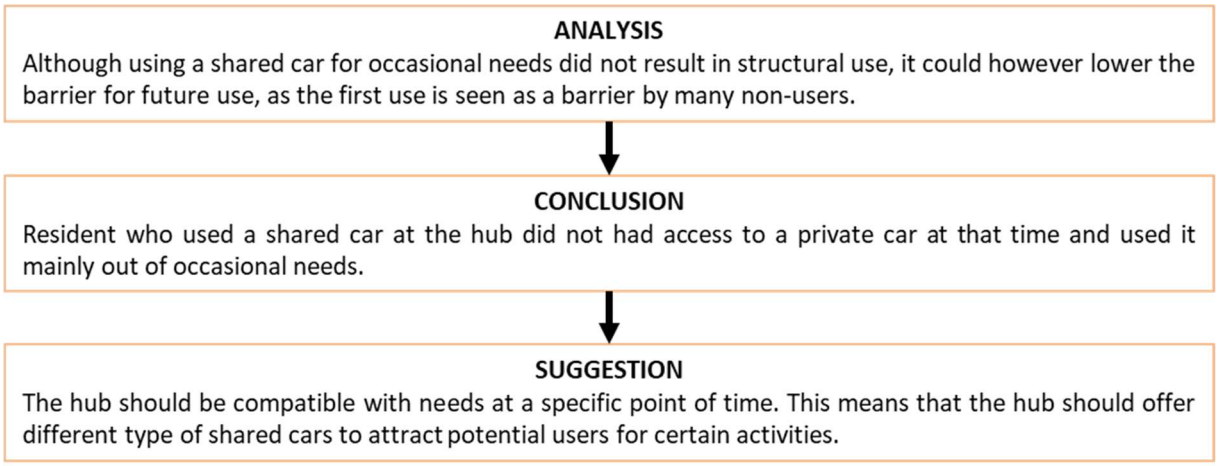


FIGURE 5-3 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING "SHARED CAR USERS"

Short remarks

- Residents in this group often do not own a car, which is why it is more likely for them to use a shared car at this hub compared to other residents.
- Besides that the residents in this group did not have access to a personal car at the time they were using a shared, they also mainly used a shared car for occasional needs.

CLUSTER 2 - NON-USERS WHO OWN A CAR

The residents that own and use a car and have never used a shared car at the mobility hub are an interesting group. Given the fact that they have the opportunity to use a shared car at this hub, since it is within a 350m walk and the hub offers multiple (4 in total) shared cars. According to the literature the walking distance therefore should not be a barrier. Moreover, in the period (27/11/2023 till 5/12/2023 between 8:00 and 17:00) in which the interviews were conducted there has been at least one shared car available. Which would suggest that the availability of shared cars at this mobility hub would not be a barrier as well. The reasons why this group would or would not use a shared car at this hub are shown in Figure 5-4, if this reason was given by 10% or more of the residents in this group.

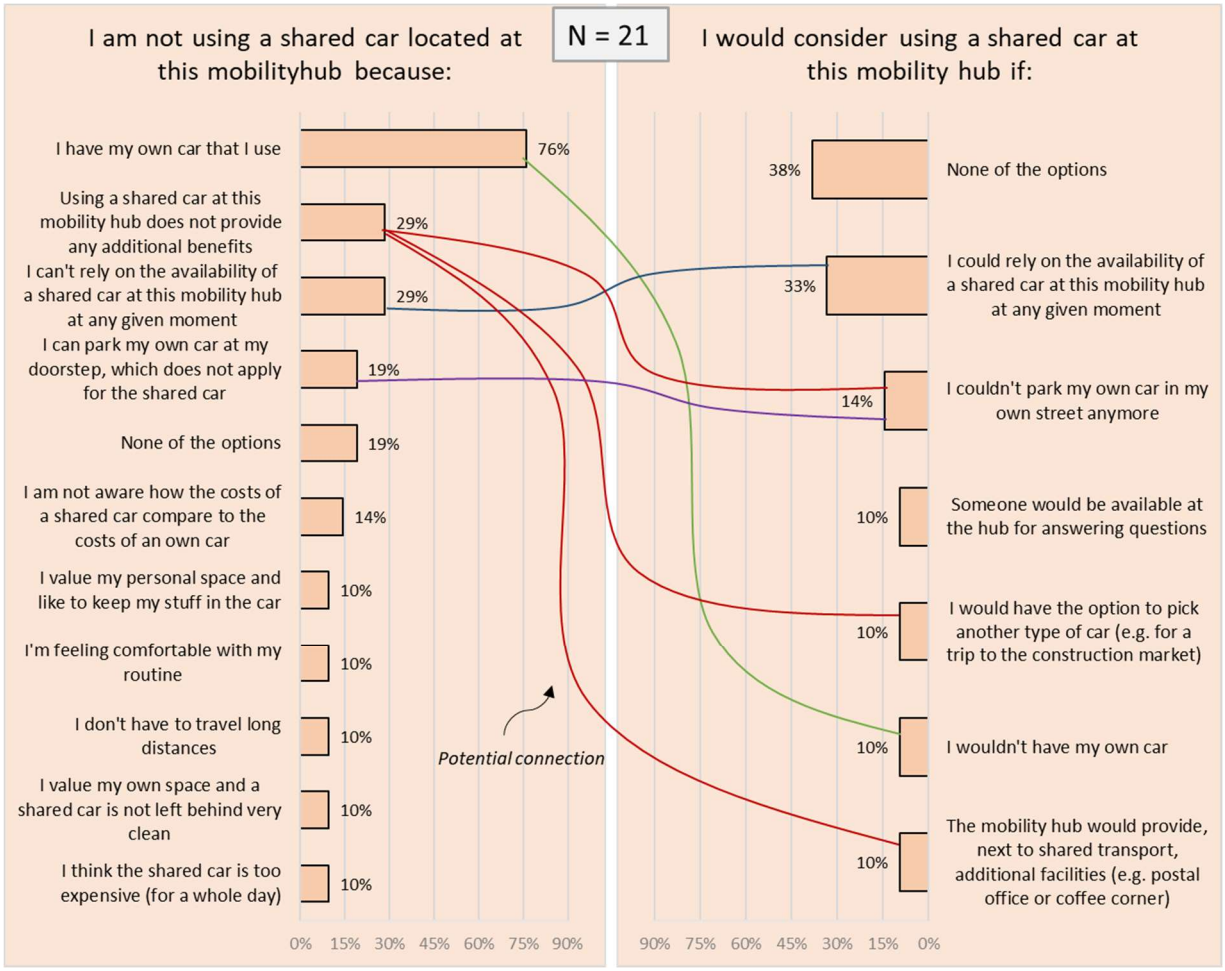


FIGURE 5-4 WHY RESIDENTS WHO OWN A CAR DID NOT USE A SHARED CAR COMPARED TO REASONS WHY THEY WOULD CONSIDER

For these car owners the factor that seems to contribute the most to their choice not to use a shared car at this mobility hub is that they own a car. This reason was given by 84% of the residents in this group. Another reason for them not to use the shared car at this mobility hub is that they do not believe that using a shared car at this mobility hub provides additional benefits.

ANALYSIS

The results suggest that whether the shared cars would be free-floating, station-based or located at a mobility hub would be irrelevant. However, other reason besides "I have my own car" were mentioned. For example, they don't believe that using a shared car at this mobility hub provides additional benefits. Which relates to the fact that they would consider if:

- they have the option to pick another type of shared car;
- they couldn't park their own car in their street anymore;
- and in case the mobility hub would provide, next to shared transport, additional facilities.

↓

CONCLUSION

Car owners don't believe that using a shared car at this mobility hub would provide additional benefits.

↓

SUGGESTION

The mobility hub should offer different type of shared cars (i.e. different models and sizes), parking convenience and additional facilities.

FIGURE 5-5 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING "NON-USERS WHO OWN A CAR"

The residents mention that they cannot rely on the availability of a shared car at this mobility hub at any given moment. The residents say they would consider the use of a shared car if they could rely on its availability at this mobility hub.

ANALYSIS

During the interviews there has been at least one shared car available at this hub. Therefore, the initial observation that the availability wouldn't be a barrier at this location seems to be wrong. This could be because the residents own a car and are therefore not actually aware of the availability of shared cars at this hub; there aren't normally any cars available at this time or outside of this time window; or one shared car that is standing still at any given time is not enough to make them feel like they can rely on the availability of a shared car.

↓

CONCLUSION

Car owners do not believe they can rely on the availability of a shared car at this mobility hub at any given time.

↓

SUGGESTION

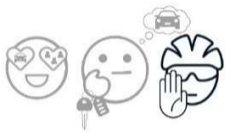
A mobility hub should create the idea that residents can use a shared car located there at any time. This would mean offering more shared cars than needed or reserving cars for emergencies only.

FIGURE 5-6 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING "NON-USERS WHO OWN A CAR"

Short remarks

- Not every owner of a car mentioned this ownership as a reason why they had not yet used a shared car at this mobility hub.
- Some of the private car owners considered this ownership as a reason not to use a shared car, but also mentioned that other aspects weight in their decision-making process whether to use a shared car at this mobility hub.
- There are also residents who do not see the need to use a shared car at this mobility hub, solely because they currently own a car.

CLUSTER 3 - NON-USERS WHO DO NOT OWN A CAR



Residents who do not own a car and still have not used a shared car at the mobility hub are also an interesting group. They are all in the possession of a driver's license and live within 350m of the hub. Therefore, the walking distance should not be a barrier and according to the literature this group would presumably use a shared car located here in case they would need a car because they do not own one. However, they did not use a shared car at this hub. This seems to suggest that they have no reason to use a car. The results do show that this is part of the reason why they have never used a shared car here, but the residents provide different reasons as well. These reasons are shown in Figure 5-7 in case they have been mentioned by 10% or more of the residents in this group.

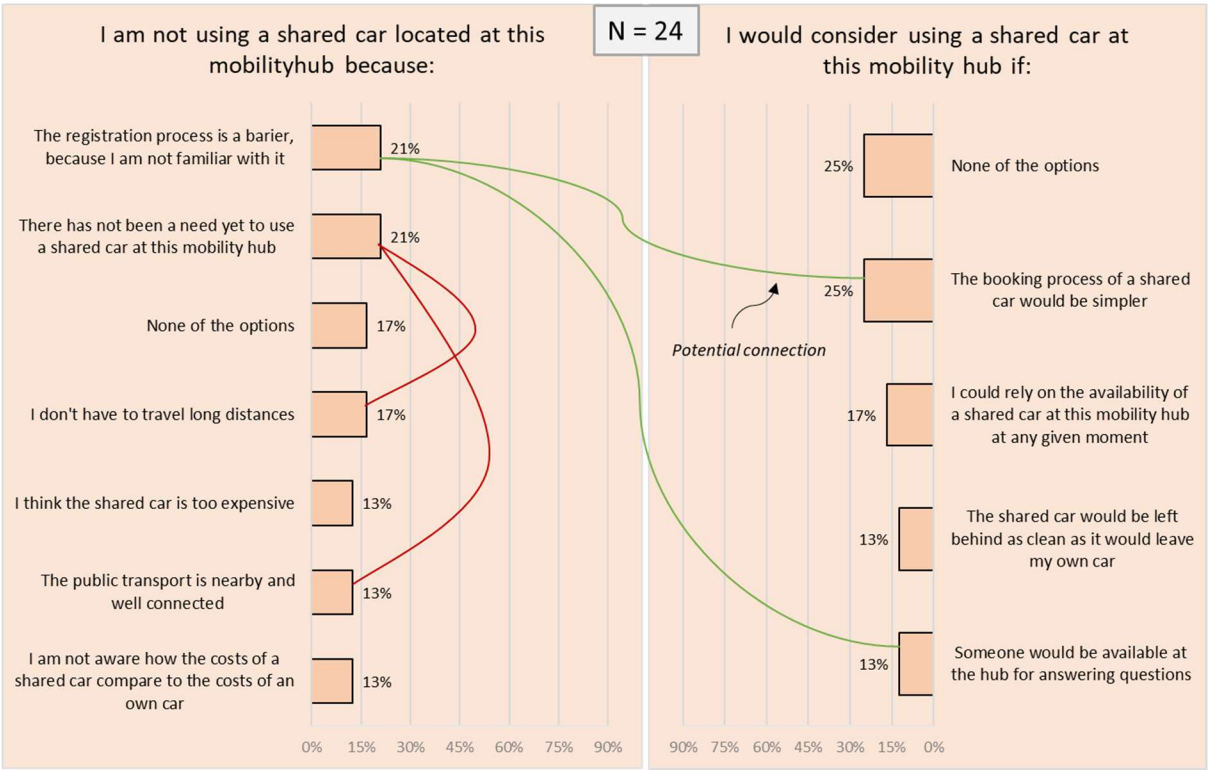


FIGURE 5-7 WHY RESIDENTS WHO DO NOT OWN A CAR DID NOT USE A SHARED CAR COMPARED TO REASONS WHY THEY WOULD CONSIDER

For these car owners the factor that seems to contribute the most to their decision not to use a shared car at this mobility hub is that do not need a car. One resident even mentioned that the IKEA was so nearby they could walk the shopping cart back to their house, making the use of a shared car for transport unnecessary. The fact that there is no need for them to use partly connects to the aspects that: they do not have to travel long distances and that the public transport is nearby and well connected. This relates to the identified theme "the hub's function in the transportation system". However, this seems not to be the only reason, residents mention they see the registration process as a barrier and weigh financial aspects in their decision-making process as well.

ANALYSIS

Since this mobility hub is not located near a train station, it would suggest that this hub should offer a round trip solution. The hub does this by providing multiple shared cars (4 in total). However, the hub seems to be located in an area where non-car owners don't need to travel long distances (i.e. they can walk or bike to their destinations) and are content with the service of nearby public transport. The results therefore suggest that a round trip solution with shared cars might not be the function of the hub that is required in the transportation system at this location.

↓

CONCLUSION

For non-car owners there seems to be no need to use a shared car at this mobility hub.

↓

SUGGESTION

The mobility hub should be located further away from public transport and destinations for which residents might need a car.

FIGURE 5-8 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING "NON-USER WHO DO NOT OWN A CAR"

The residents seem to be unaware of the registration process and the accompanied costs. By some residents (8% of this group) it was mentioned that they would consider using a shared car if there would be clear and easy information provided at the hub regarding the registration process, the process of using a car and the accompanied costs.

ANALYSIS

The unawareness amongst the residents seems to be a barrier for them to use a shared car at the hub. It was already mentioned in Paragraph 3.2.6 that it is important that the mobility hub plays a role in lowering the barrier for first use (e.g. because of psychological influences).

↓

CONCLUSION

Unawareness seems to be a barrier for non-car owners to start using shared cars.

↓

SUGGESTION

The mobility hub should provide clear and easily accessible information (e.g. an information board) about the registration process, the process of using a shared car and the accompanied costs.

FIGURE 5-9 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING "NON-USER WHO DO NOT OWN A CAR"

Short remarks

- For non-car owners there seems to be no need to use a (shared) car.
- The lack of information seems to be a barrier for potential users who have never used it before.

5.2.2 CONSIDERING THE WHOLE RESPONDENTS GROUP

The first Thematic Content Analysis (TCA) considered the whole group of respondents. From the residents who are aware of this location 51% knew that it offers shared cars and 43% was familiar with this location as a mobility hub. From the residents who are aware of this location 17% had used a shared car there. There were no structural users found, not even among the residents who do not own a car themselves. The incidental users that have been found needed the shared under certain circumstances (e.g. their own car was at that point unavailable) or when they needed the shared car for a certain occasion (e.g. traveling to a location public transport could not reach). At the same time, this means that 83% has never used a shared car at the mobility hub, for which they provide different reasons. Some (67%) would consider using a shared car in case certain aspects would apply, of which (44%) currently owns a car. This represents three categories:

1. Contributing themes in the decision to not use a shared car at the hub;

2. Themes that weigh in the consideration to use a shared car at the hub;

3. Themes that contribute to the use of a shared car at the hub.

Therefore, the Thematic Content Analysis (TCA) has been conducted separately for each category. This TCA considered the whole group of respondents. When an identified subtheme is mentioned by 10% or more of the residents it is considered to be valued by the potential users of the mobility hub. This paragraph presents all the subdivided themes that are mentioned by 10% or more of the residents, Table 5-3. For each of these subthemes a description is made of all that has been said regarding it, Paragraph 0. Based on these descriptions suggestions per subtheme are made for the potential role of a mobility hub.

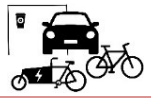
	MAIN-THEMES		SUBTHEMES
	**Financial aspects** (Paragraph 5.3.1)		*Not divided in subthemes*
	**Functional requirements** (Paragraph 5.3.2)		The hub's function in the transportation system Availability
	**Personal requirements** (Paragraph 5.3.3)		*No subthemes exceeded the threshold*
	**Aspects of the journey** (Paragraph 5.3.4)		The process of using a car The travel distance Occasional needs
	**Attitude of potential users** (Paragraph 5.3.5)		Convenience
	**Psychological influence** (Paragraph 5.3.6)		*No subthemes exceeded the threshold*
	**Challenging characteristics of potential users** (Paragraph 5.3.7)		Unawareness
	**Aspects of a mobility hub** (Paragraph 5.3.8)		*No subthemes exceeded the threshold*

TABLE 5-3 OVERVIEW OF MAIN- AND SUBTHEMES

THE FIRST CATEGORY

There is a large group (83%) of the interviewed residents who have **not used a shared car** yet at their nearby mobility hub. Besides the theme "car-ownership", other themes seem to contribute to the decision-making process of residents whether to use a shared car located at the mobility hub, as only about half (47%) of this group owns a car. These themes are shown in Table 5-4.

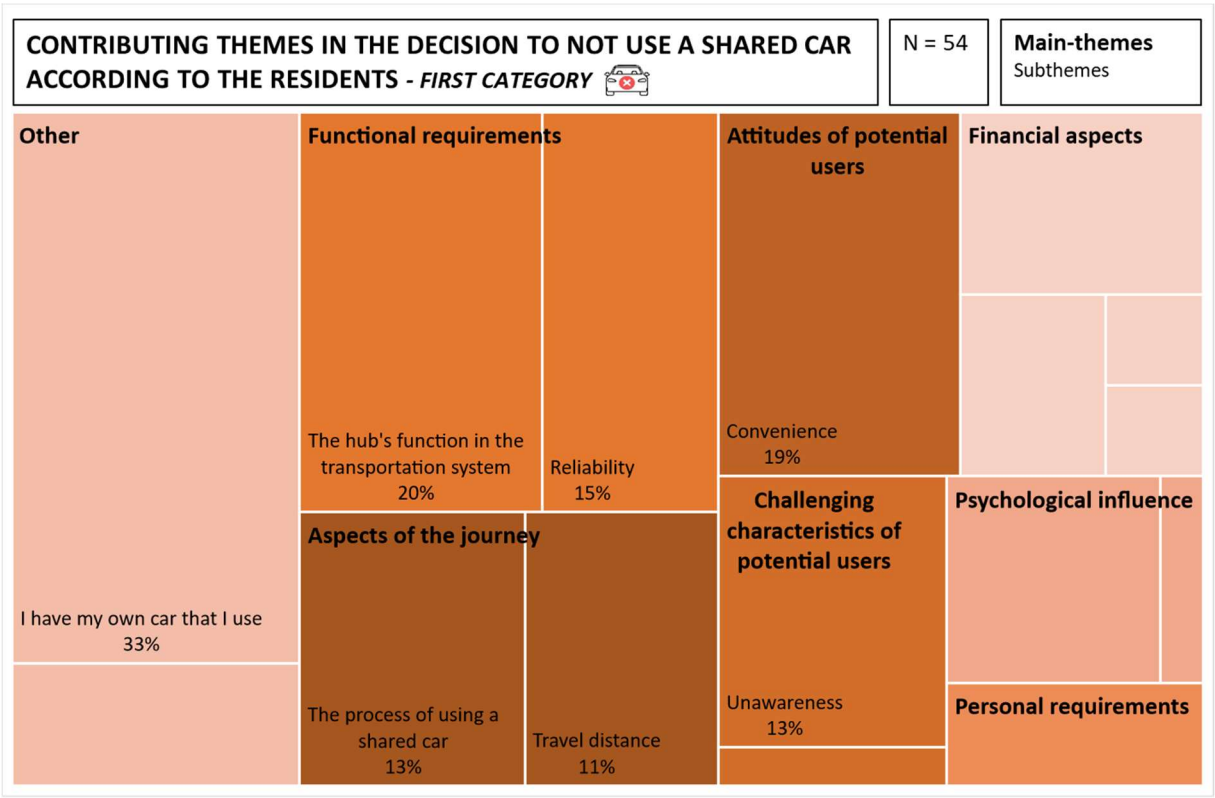


TABLE 5-4 OVERVIEW OF SUBTHEMES THAT HAVE BEEN MENTIONED BY 10% OR MORE OF THE RESIDENTS

The subthemes that are shown in Table 5-4 are mentioned by 10% or more of the residents. This table is a result of the TCA of the first category. Therefore, the following subthemes are linked to the decision not to use a shared car at the mobility hub:

- the hub's function in the transportation system (e.g. a round-trip nature);
- convenience (e.g. the hub should increase convenience);
- the process of using a car (e.g. the booking process is a barrier);
- availability (e.g. availability of shared cars);
- travel distance (e.g. there has to be a need to travel by car);
- unawareness (e.g. unaware of the costs).

It is considered that these themes have enough data to support a connection with the research subject (Paragraph 2.3.3). This connection has been analysed in more detail in Paragraph 0. There, a qualitative description is made regarding all that has been mentioned about the subtheme. Based on this description a potential role for a mobility hub in the adoption of the shared cars located at the mobility hub is suggested.

THE SECOND CATEGORY

Users and potential users mentioned various reasons regarding whether to consider using a shared car (more often) in case the hub would adhere to certain functional requirements. In addition, they indicated that they **would consider using a shared car** if the mobility hub could aid in making the booking process of a shared car simpler. Furthermore, convenience seems to play a role in their attitude toward using a shared car. The results of the TCA that are linked to the consideration to use a shared car at the hub are shown in Table 5-5.

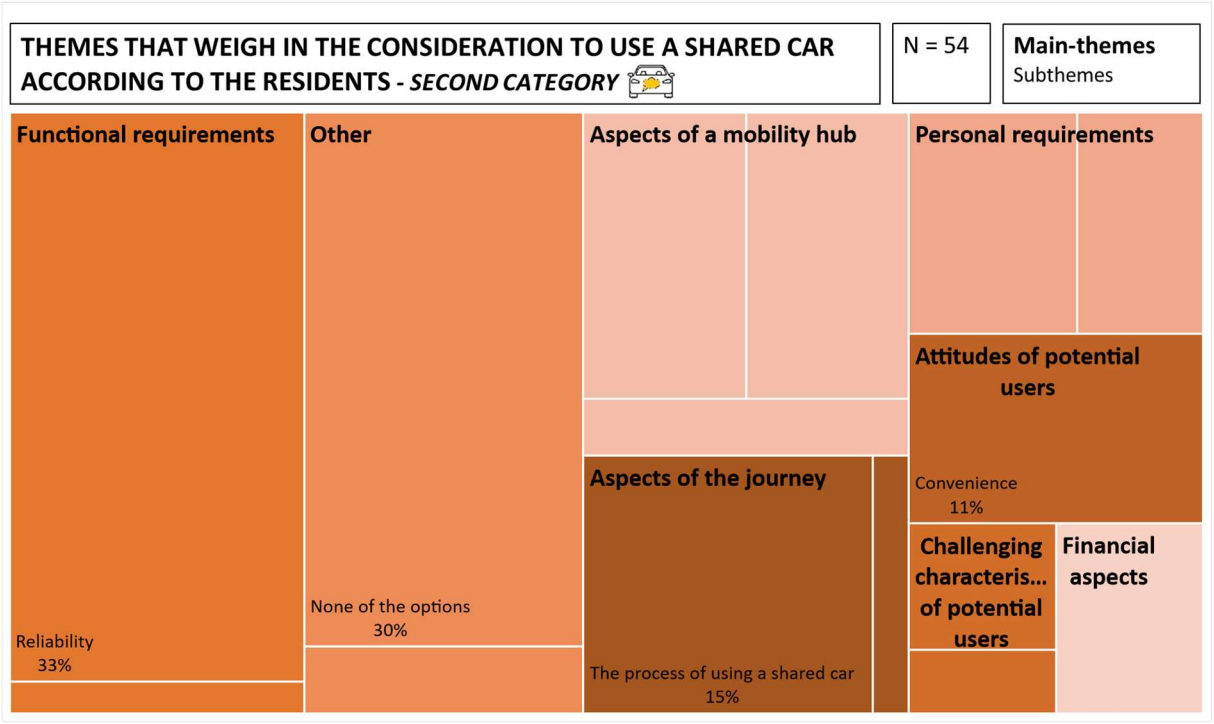


TABLE 5-5 OVERVIEW OF SUBTHEMES THAT HAVE BEEN MENTIONED BY 10% OR MORE OF THE RESIDENTS

The subthemes that are shown in Table 5-5 are mentioned by 10% or more of the residents. This table is a result of the TCA of the second category. Therefore, the following subthemes are linked to the consideration to use a shared car (more often) at the mobility hub:

- convenience (e.g. the hub should increase convenience);
- the process of using a car (e.g. the booking process is a barrier);
- availability (e.g. availability of shared cars).

It is considered that these themes have enough data to support a connection with the research subject (Paragraph 2.3.3). This connection has been analysed in more detail in Paragraph 0. There, a qualitative description is made regarding all that has been mentioned about the subtheme. Based on this description a potential role for a mobility hub in the adoption of the shared cars located at the mobility hub is suggested.

THE THIRD CATEGORY

In total 9 interviewed residents have **used a shared car at the mobility hub**. Therefore, it seems that the reasons they mentioned contributed to the use of a shared car at the mobility hub. The themes that are linked to these reasons are shown in Table 5-6.

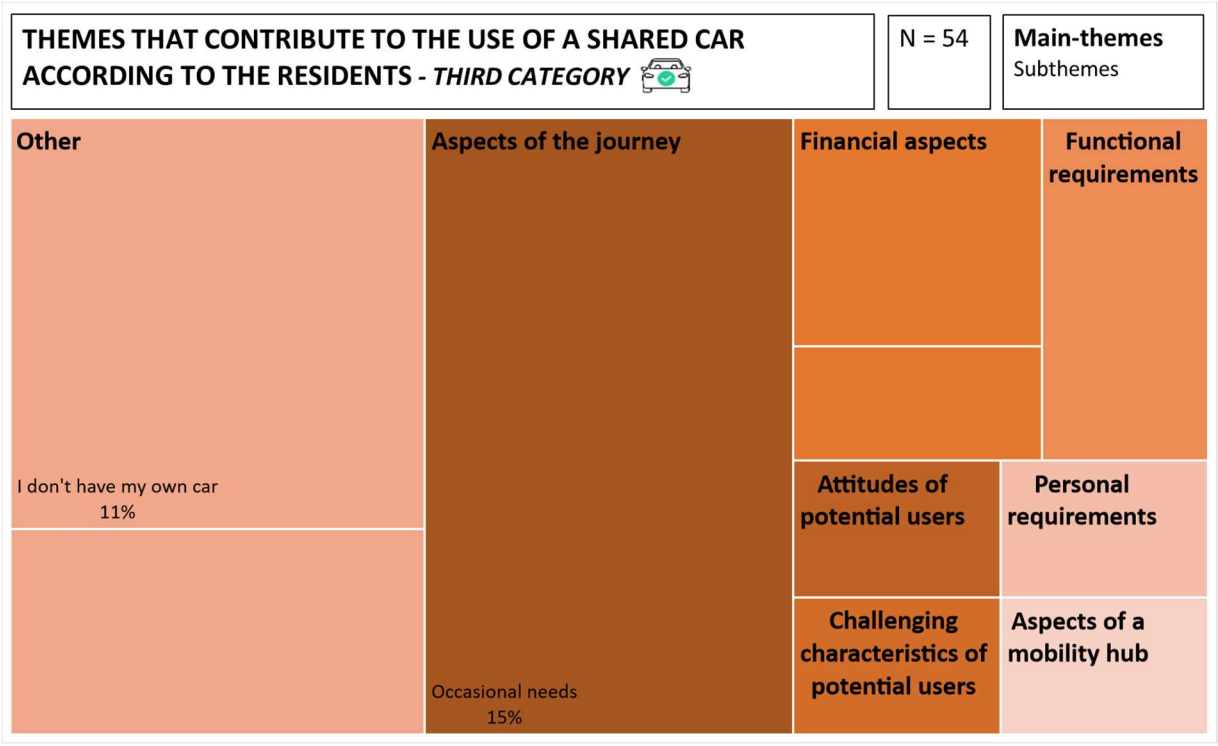


TABLE 5-6 OVERVIEW OF SUBTHEMES THAT HAVE BEEN MENTIONED BY 10% OR MORE OF THE RESIDENTS

The subthemes that are shown in Table 5-6 are mentioned by 10% or more of the residents. This table is a result of the TCA of the third category. Therefore, the following subthemes are linked to the decision to use a shared car at the mobility hub:

- occasional needs (e.g. when the residents own car is unavailable).

It is considered that this theme has enough data to support a connection with the research subject (Paragraph 2.3.3). This connection has been analysed in more detail in Paragraph 0. There, a qualitative description is made regarding all that has been mentioned about the subtheme. Based on this description a potential role for a mobility hub in the adoption of the shared cars located at the mobility hub is suggested.

5.3 DESCRIPTION AND ANALYSIS OF THE REOCCURRING THEMES

This Paragraph describes what has been mentioned by the interviewed residents regarding the identified main-themes in the extensive literature study, Chapter 3. In case a subtheme is mentioned by 10% or more of the interviewed residents it suggests that it weighs more than others in the decision-making process whether to use a shared car at the hub. Therefore, these are highlighted in addition to the main-themes.

5.3.1 FINANCIAL ASPECTS

Residents who considered using a shared car or had a previous experience with its use often mentioned the expense. They either thought it was too expensive for a short time (e.g. because of the minimum fee) or for a whole day (e.g. in comparison to the use of a private car). Another group mentioned that they do not know what the expenses of using a shared car are, either in general or in comparison to the ownership of a car. The group that is unaware of the expenses mentioned that they see it as a barrier to start using a shared car. The residents indicate that in case, a mobility hub could play a role in providing easily accessible and clear information about the costs at the location, it would lower the barrier for them. For example, a respondent said: "It is not clearly visible which shared provider you have to deal with, how much the accompanied costs are per provider and which steps in the booking process you have to go through. I would need an information source which quickly provides these insights in order for me to consider using a shared car".

In general the mobility hub probably will not have much influence on the expenses regarding the use of the shared cars located there, because this price is determined by its provider. The hub could however adjust its function in the transportation system. One option to deal with this problem is that a hub should be connected to a system which makes it possible to drive from one hub to another so the users will not pay for the shared car while it is standing still (e.g. when they only use it for the drive to work in the morning and back in the evening). Another option is that the mobility hub should be located in an area where shared cars are needed for middle large periods of time (i.e. the duration of the trip has to be worth the minimum fee, while preventing that it becomes more favourable to use a private car again). Finally, lowering the financial unawareness could for example be realised at the mobility hub with an information sign that shows this information in a more visible way or with a service point where potential users could ask questions.

5.3.2 FUNCTIONAL REQUIREMENTS

The residents indicate with their answers that they weigh functional requirements in their decision-making process whether to use a shared car. Because when a subtheme is mentioned by 10% or more of the residents it is considered to be valued by the residents, Paragraph 2.3.3. Therefore, in this paragraph suggestions are made for the potential role of a mobility hub considering the influences of the subthemes *"the hub's function in the transportation system"* and *"availability"*.

THE HUB'S FUNCTION IN TRANSPORTATION SYSTEM IS LINKED TO NON-USE BY 20% OF THE RESIDENTS

The qualitative description below describes what has been mentioned by the residents regarding the subtheme *"the hub's function in the transportation system"*. This description has been analysed in Figure 5-10.

QUALITATIVE DESCRIPTION

The location and other available modes of transport in the area determine which function the mobility hub has in the transportation system. The residents often mention that they feel that there is no need to use. This is caused by various reasons: they can easily use their own car; they leave nearby a well-connected public transportation system or they can travel by bike because of small travel distances.

To incentivize the use of a shared car at the mobility hub the hub's function in the transportation system should either be that is offers last-mile solution, which for example works well at train stations, or offer a round-trip solution when the hub is disconnected from a train station. In this area there was little need for a round-trip solution or a last-mile solution.

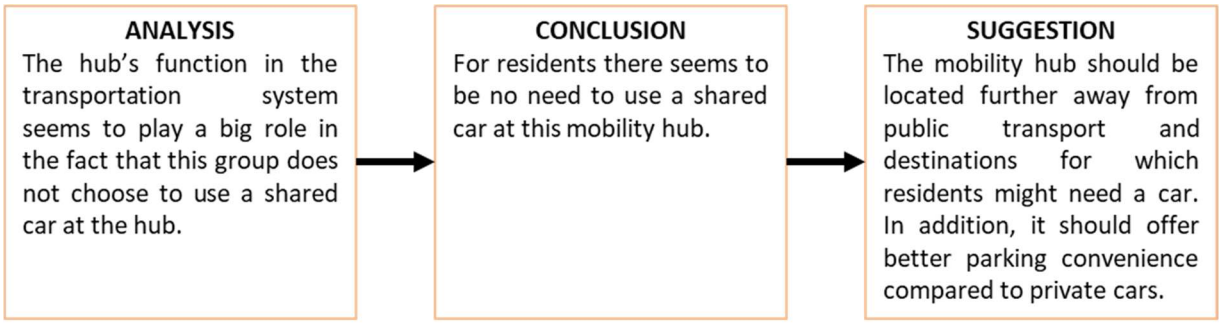


FIGURE 5-10 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "THE HUB'S FUNCTION"

AVAILABILITY IS LINKED TO NON-USE BY 15% AND TO POTENTIAL USE BY 33% OF THE RESIDENTS 

The qualitative description below describes what has been mentioned by the residents regarding the subtheme *"availability"*. This description has been analysed in Figure 5-11.

QUALITATIVE DESCRIPTION

The residents mentioned that they could not always rely on the availability of a shared car at this hub. Which for them contributed in their choice to not use a shared car. At the same time an even larger group said that it would weigh in their consideration to use a shared car. This is in line with the results from the extensive literature study and the interviews with experts.

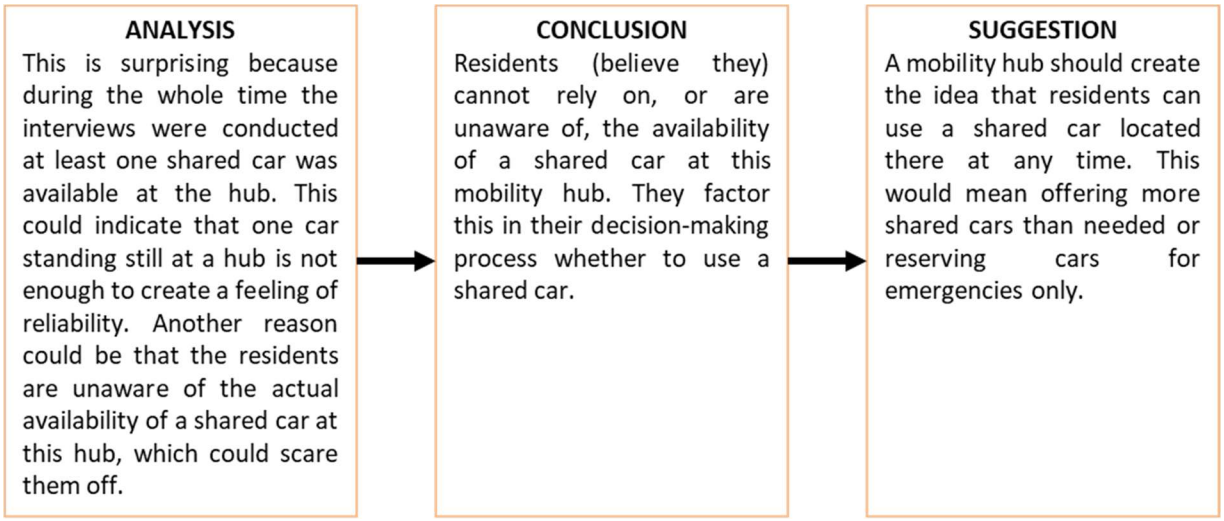


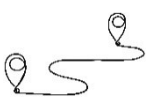
FIGURE 5-11 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "AVAILABILITY"

5.3.3 PERSONAL REQUIREMENTS

The personal requirements mentioned where mostly linked to personal space and the cleanliness of the shared cars. For example one resident mentioned: "I do not use a shared car because I like to keep my stuff in my car".

A shared car is by definition not personal. However, a mobility hub could provide a resembling benefit by providing personal lockers next to the shared cars. In addition, the mobility hub could provide a service that keeps the cars clean from inside and out.

5.3.4 ASPECTS OF THE JOURNEY



Before using a shared car the journey starts by booking it. The booking process of a shared car seems to be a valued aspect of the journey. For example, a respondent mentioned that: "I would consider using a shared car at the mobility hub in case the information sign would provide better information, right now there is not a way to gain easily and quickly information regarding the booking process". In addition, most residents seem to only travel short distances (i.e. distance that can be travelled by foot or bike).

When a subtheme is mentioned by 10% or more of the residents it is considered to be valued by the residents, Paragraph 2.3.3. Therefore, in this paragraph suggestions are made for the potential role of a mobility hub considering the influences of the subthemes *"the process of using a car"*, *"the travel distance"* and *"occasional needs"*.

THE PROCESS IS LINKED TO NON-USE BY 13% AND TO POTENTIAL USE BY 15% OF THE RESIDENTS

The qualitative description below describes what has been mentioned by the residents regarding the subtheme *"the process of using a car"*. This description has been analysed in Figure 5-12.

QUALITATIVE DESCRIPTION

The residents indicate that the booking process of a shared car is seen as a barrier for using it. There are multiple reasons given for this: the booking process is complex because for each shared car provider it is different; the conditions of signing up are unfavourable of difficult; they are unaware of how it all works.

ANALYSIS	CONCLUSION	SUGGESTION
Booking a shared car should have the same process for each provider. It is unclear which role a mobility hub could play in this as this is an integral problem. A simpler role for the mobility hub could be to provide easily accessible, clear and visible information about the booking process.	Residents see the booking process of a shared car as a barrier. Either because they find it too complex or because it is unknown to them.	The mobility hub should provide easily accessible, clear and visible information (e.g. with an information board) regarding the booking process of a shared car per provider.

FIGURE 5-12 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "THE PROCESS OF USING A CAR"

THE TRAVEL DISTANCE IS LINKED TO NON-USE BY 11% OF THE RESIDENTS

The qualitative description below describes what has been mentioned by the residents regarding the subtheme *"the travel distance"*. This description has been analysed in Figure 5-13.

QUALITATIVE DESCRIPTION

The residents who live nearby this mobility hub suggested that they feel no need to use a shared car because they only have to travel small distances which they can do by foot, bike or public transport. For example, a resident even mentioned that the IKEA is so close that they can walk the shopping cart back to their house, making the use of a car unnecessary.

ANALYSIS	CONCLUSION	SUGGESTION
It seems that when residents can travel a relative short distance by foot, bike or public transport, it is preferred over the use of a shared car.	For residents there seems to be no need to use a shared car at this mobility hub because of short travel distances.	The mobility hub should be located further away from public transport and destinations for which residents might need a car.

FIGURE 5-13 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "THE TRAVEL DISTANCE"

OCCASIONAL NEEDS ARE LINKED TO REASONS TO USE A SHARED CAR BY 15% OF THE RESIDENTS

The qualitative description below describes what has been mentioned by the residents regarding the subtheme *"occasional needs"*. This description has been analysed in Figure 5-14.

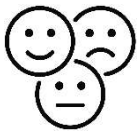
QUALITATIVE DESCRIPTION

The residents who did use a shared car mainly used it for a specific purpose (e.g. moving heavy stuff) or moment in time (e.g. their own car was currently unavailable). The extensive literature study and expert interviews indicate that this might lower the barrier to use a shared car at this mobility hub in the future. However, according to the interviewed residents it did not result in any structural use of a shared car or the disposal of their private car.

ANALYSIS	CONCLUSION	SUGGESTION
The shared cars at the mobility hub were mainly used for occasional needs. This did not result in structural use. However, it is more likely for this group to use a shared car again in the future because they are now familiar with the concept. The fulfilment of their occasional needs was not linked to the type of shared car that was offered.	Residents use a shared car mainly for a specific purpose or moment in time, which does not seem to result in structural use.	The mobility hub should expand the type of cars offered to fulfil more occasional needs (e.g. offer a service of renting a car).

FIGURE 5-14 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "OCCASIONAL NEEDS"

5.3.5 THE ATTITUDES OF POTENTIAL USERS



In Paragraph 3.2.5 is shown whether potential users experience convenience regarding their mode of transport is linked to their attitude. Although no link could be found in the interviews with residents between a positive attitude towards shared mobility and the use of a shared car, the residents do suggest that whether they experience convenience is important. This is suggested because 19% consider inconvenience as a part of the reason for them not to use a shared car at this mobility hub. While 11% would consider using a shared car at this mobility hub if this would increase their convenience (e.g. in case only a shared car could be parked at their doorstep). Therefore, suggestions are made for the potential role of a mobility hub considering the influences of these subthemes.

INCONVENIENCE IS LINKED TO NON-USE BY 19% OF THE RESIDENTS 

The qualitative description below describes what has been mentioned by the residents regarding the subtheme *"inconvenience"*. This description has been analysed in Figure 5-15.

QUALITATIVE DESCRIPTION

Residents found it generally more convenient to use their own car because they could park near their doorstep. The municipality of Utrecht already has implemented parking restrictions (e.g. they stopped giving parking permits) in this area to disincentivize the use of private cars. However, at this moment still many residents already own a parking permit.

ANALYSIS	CONCLUSION	SUGGESTION
Residents provide an odd statement, given the fact that they did not see the walking distance to the shared car as a barrier. This is probably because of how the reaction is formulated. What the residents actually seem to say is that they think it is convenient that they can park their car close by their doorstep, which would be the same regarding the shared car at the mobility hub, so the shared car does not provide an additional benefit for them. Which is in line with their reaction saying: "Using a shared car at this mobility hub does not provide any additional benefits", which is also mentioned a lot.	Residents found no extra convenience in using the mobility hub. For example, they could both park their car as well as the shared car at their doorstep.	The mobility hub should offer additional benefits. This could mean offering a better parking convenience in comparison to private cars. However, this could only be realised together with flanking policies (e.g. parking restrictions).

FIGURE 5-15 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "INCONVENIENCE"

CONVENIENCE IS LINKED TO POTENTIAL USE BY 11% OF THE RESIDENTS 

The qualitative description below describes what has been mentioned by the residents regarding the subtheme *"convenience"*. This description has been analysed in Figure 5-16.

QUALITATIVE DESCRIPTION

Residents mentioned that they value the convenience of parking their own car at the doorstep. Moreover, if they would not be able to do this anymore they would consider using a shared car at this mobility hub because of the close walking distance from their house to the shared car located there.

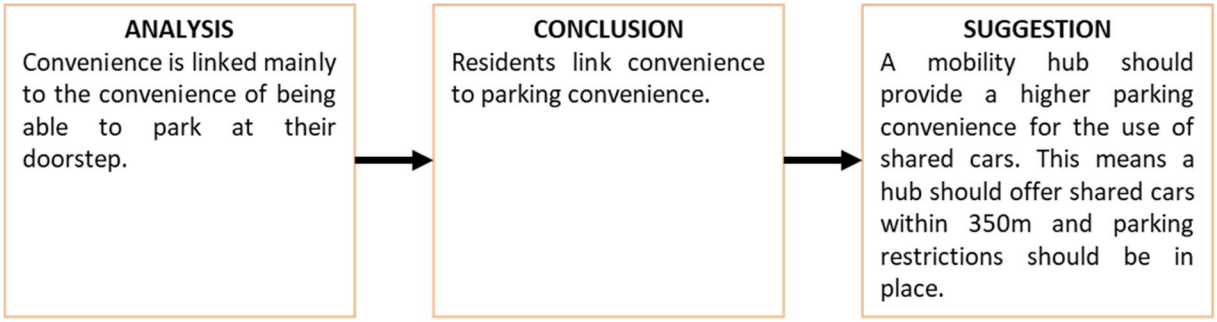


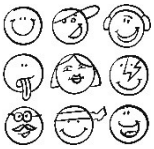
FIGURE 5-16 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "CONVENIENCE"

5.3.6 PSYCHOLOGICAL INFLUENCE

During the interviews the residents seem to indicate that behavioural inertia plays a role in their decision not to use a shared car. This is suggested because they (9% of the interviewed residents) mentioned that they are feeling comfortable with their routine regarding their used travel mode. In addition, a resident mentioned that: "The ownership of my car reflects something; I have worked hard for it". Which indicates that for this resident the status a private car represents is important.

To break through the behavioural inertia the mobility hub should focus on making the first drive with a shared car located their more attractive. The status someone links to a private car is something that would be more difficult to change with the benefits of a hub.

5.3.7 CHALLENGING CHARACTERISTICS OF POTENTIAL USERS



Challenging characteristics of potential users have been identified. For one resident personal believes (e.g. he believed that it is unnecessary for everyone to own a car) played a role in his decision-making process whether to use a shared car. Another resident had a car demanding occupation. The possession of the characteristic "unawareness" been linked to non-use for 13% of the residents. Therefore, suggestions are made for the potential role of a mobility hub considering the influence of this subtheme.

UNAWARENESS IS LINKED TO NON-USE BY 13% OF THE RESIDENTS 

The qualitative description below describes what has been mentioned by the residents regarding the subtheme *"unawareness"*. This description has been analysed in Figure 5-17.

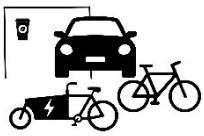
QUALITATIVE DESCRIPTION

Often residents were unaware of the expenses of a shared car or its booking process. This unawareness contributed in their decision to not us a shared car. For them the effort they had to put into finding out by themselves what the costs are (e.g. in comparison to the ownership of a car) or how the booking process works (e.g. singing up by a shared car provider) was seen as a barrier.

ANALYSIS	CONCLUSION	SUGGESTION
Not only the unawareness seems to be a barrier. This barrier also links to the effort that is required by the residents to become aware.	The effort to become aware of the booking process and the accompanied costs are seen as a barrier by the residents.	The mobility hub should provide easily accessible, clear and visible information (e.g. with an information board) regarding the booking process ant the accompanied costs of a shared car per provider.

FIGURE 5-17 ANALYSIS, CONCLUSION AND SUGGESTION REGARDING THE SUBTHEME "UNAWARENESS"

5.3.8 ASPECTS OF A MOBILITY HUB



The value of earlier indicated aspects of a mobility hub (i.e. types of shared cars offered, presence of additions for shared cars, additional facilities and a manned service point) have not been fully recognised by the residents. One resident liked that he had the flexibility to choose out of different type of models. None of the residents seemed to be more willing to consider the use of a shared car in case the mobility hub would provide access to certain additions (e.g. bike carriages). Five residents (9%) would value additional facilities at the hub and would weigh it in their consideration whether to use a shared car at the hub and six residents (11%) liked the idea that they could ask questions to someone at the hub.

5.4 CHAPTER SUMMARY

Findings in the literature study (Chapter 3) suggested that the main-themes in Table 3-1weigh more in the decision-making process whether to use a shared car in comparison to other factors. The findings in the interviews with the residents are subdivided under these main-themes in Table 5-7.

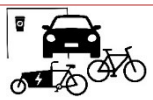
		
Financial aspects	**Functional requirements**	**Personal requirements**
• Residents who mentioned the accompanied expenses of using a shared car either thought it was too expensive for a short time (e.g. because of the minimum fee), or for a whole day (e.g. in comparison to the use of a private car). • The group that is unaware of the expenses mention that they see it as a barrier to start using a shared car	• For the residents there seems often to be no need to use a shared car at this mobility hub and they also believe that they cannot rely on the availability of a shared car at this hub.	• Personal requirements were linked to personal space and the cleanliness of shared cars
		
Aspects of the journey	**The attitude of potential users**	**Psychological influences**
• The booking process of a shared car is seen by the residents as a barrier • Most residents seem to only travel short distances (i.e. distance that can be travelled by foot or bike)	• No link could be found in the interviews between a positive attitude towards shared mobility and the use of a shared car • Residents found no extra convenience in using the mobility hub	• Residents seem to feel comfortable with their routine regarding their current travel mode
		
Challenging characteristics of potential users		**The potential value of mobility hubs**
• The possession of the characteristic "unawareness" seemed to result in the residents not using a shared car located at the hub		• The earlier indicated potential value of a mobility hub (i.e. types of shared cars offered, presence of additions for shared cars, additional facilities and a manned service point) have not been fully recognised by the residents

TABLE 5-7 SUMMARY OF INTERVIEWS WITH RESIDENTS

5.5 SUB CONCLUSION 3

Sub question 3: Which aspects of a mobility hub could stimulate residents to use a shared car located at their nearby mobility hub?

The aspects of a mobility hub that could stimulate the residents to use a shared car at the hub are: offering shared cars that resonate with occasional needs, ensuring availability of shared cars and providing information about the booking- / registration process & the accompanied costs. In addition, flanking policies and the hub's function in the transportation system influence the use of the shared cars that are located at the hub because the residents indicate that there is often no need for them to use a shared car at this mobility hub.

Three groups of residents have been distinguished: shared car users, non-users who own a car and non-users who do not own a car. Within these groups there were no structural users found (not even among the residents who do not own a car themselves), only users under certain circumstances (e.g. their own car was at that point unavailable) or when they needed the shared car for a certain occasion (e.g. moving heavy items or traveling to a location public transport could not reach). This suggests that **occasional needs** are a reason that travellers become familiar with the use of a shared car. Which means that occasional needs not only have a direct causal relationship with shared car usage, but also influences **behavioural inertia**, which is an addition to the conceptual model in Figure 3-17.

When considering all three groups together it indicates that the residents would consider using a shared car in case:

- the mobility hub would offer better **parking convenience** in comparison to private cars;

  *The residents indicate that they mainly relate parking convenience to the amount of **convenience** they experience*, which has a causal relationship with shared car usage, Figure 3-17.

- they would feel that they could rely on the **availability** of a shared car at the hub at any time;

  *The residents indicate that they mainly relate **availability** of the shared cars to the feeling of reliability. Therefore, this confirms that the availability not only has a direct causal relationship with shared car usage, it also influences reliability (Figure 3-17). In addition, the relationship between the availability and reliability seems to be influenced by **unawareness**, because during the interview there constantly was at least one shared car available at the mobility hub of which the residents seemed unaware.*

- the **booking process** would be less of a barrier;

  *The residents perceive the booking process of a shared car as a barrier, either because they think it is too complicated or because they perceive **the effort to become aware** of the booking process as too big of a barrier, which is an addition to the conceptual model in Figure 3 17.*

- and the use of a shared car would be **less expensive** for short and long trips.

  ***The travel distance** has on influence on the costs of the trip by shared car. Therefore, the travel distance influences the causal relationship between **financial aspects** and shared car usage Figure 3-17). In addition, the distance that residents need to travel influences **the hub's function** in the transportation system. For example, when destinations are within biking range it is less likely that travellers would use a shared car as a mode of transport. Therefore, the travel distance influences the hub's function and the relationship between **the need to use** and shared car usage. This influence is an addition to the conceptual model in Figure 3-17.*

In addition to this, the *"shared car users"* and *"non-users who own a car"* indicate they would consider using a shared car at the mobility hub (more often) in case the hub would offer **additional facilities**. This could mean that offering additional facilities not only influences the number of potential users at a hub (Paragraph 0), but also has a direct correlation with shared car usage. The *"non-users who own a car"* add to this that they would consider using a shared car at the mobility hub if they would have the option to pick another **type of car**. This indicates that offering different types of shared cars influence the occasional needs, which is the most common reason to use a shared car at this mobility hub. This influence is an addition to the conceptual model in Figure 3-17. The group that exists of *"non-users"* indicate that they would consider using a shared car in case **someone**

would be available at the hub to answer questions about the booking process. Therefore, a **manned service point** at the mobility hub could influence shared car usage, which is an addition to the conceptual model in Figure 3 17.

5.5.1 Recommendations for policymakers and hub developers

In the answers of the interviews with the residents reoccurring themes have been identified. Recommendations are made for guidelines regarding the layout of a mobility hub to influence the relationships between the identified themes and shared car usage. The guidelines are based on the identified subthemes, because these gave a more detailed understanding in comparison to the main-themes. The following guidelines are suggested with the goal to incentivize the use of shared cars located at a mobility hub:

- offer shared cars within 350m of the residents' households and parking restrictions should be in place;
- offer more shared cars than needed or reserve one for emergencies only;
- provide easily accessible, clear and visible information regarding the booking process and costs of a shared car per provider;
- and expand the type of cars offered to fulfil more occasional needs (e.g. offer a service of renting a car).

Regarding the financial barrier, one option to deal with the financial barrier could be to connect the hub to a system of hubs which makes it possible to drive from one hub to another, so the users will not pay for the shared car while it is standing still (e.g. when they only use it for the drive to work in the morning and back in the evening). Another option is that the mobility hub should be located in an area where shared cars are needed for middle-large periods of time (i.e. the duration of the trip has to be worth the minimum fee, while preventing that it becomes more favourable to use a private car again).

In addition the residents indicated that there often is no need for them to use a shared car at the mobility hub. Therefore, it is suggested that a mobility hub should be located further away from public transport and destinations for which residents might need a car.

6 COMPARISON BETWEEN THE FINDINGS

The data that has been collected for each sub question has been analysed with a Thematic Content Analysis (TCA). This resulted in reoccurring subthemes that are related to: financial aspects; functional requirements; personal requirements; aspects of the journey; the attitude of potential users; psychological influences; challenging characteristics of potential users and aspects of a mobility hub.

The results in the literature study, the expert interviews and the interviews with the residents present overlapping findings as well as different outcomes. It is important to know whether the overlapping results strengthen each other and why different outcomes arise. Therefore, the findings in each method are analysed in this chapter.

6.1 COMPARISON OF THE RESULTS

The overlap and difference between the results is represented in Table 6-1 till Table 6-7, accompanied by an analysis of the different outcomes. The subthemes that exceeded a threshold are highlighted and an interpretation of a theme per method is given to illustrate the various viewpoints.

FUNCTIONAL REQUIREMENTS 		
LITERATURE (threshold: >= 10%)	**EXPERTS (threshold: >= 5 times)**	**RESIDENTS (threshold: >= 10%)**
Accessibility *The walking distance to car is highly valued. Travellers accept a maximum walking distance of 350m to a shared car. In addition, travellers are less incentivized to use a shared car in case the walking distance to it is larger in comparison to a private car.*	**Accessibility** *The walking distance has a large influence on the adoption of shared cars located at a mobility hub. In addition, it is important that the shared car at the hub is 24h accessible without barriers to go through.*	**Accessibility** *The interviews were held within a 350m radius from the mobility hub. Out of 54 respondents only one respondent perceived this walking distance as too large. This indicates that a walking distance of 350m is not a barrier for the use of a shared car.*
Safety	Mentioned by 1 expert	Mentioned by 0% of the residents
Availability *The literature suggests that low availability of shared cars would have a negative effect on the adoption of shared cars. Even more so because the availability is a benefit of a private car, which is highly valued by its owners.*	Mentioned by 3 experts	**Availability** *The results of the case study indicate that when at least one available shared car at all times is not enough to create the feeling of reliability. Another reason for the feeling of unreliability could be that residents are unaware of the number of available shared cars.*
Mentioned in 2% of the articles	Visibility	3 residents were not aware of the hub at this location
Mentioned in 2% of the articles	**The hub's function in the transportation system** *The experts agree that there has to be a need for the potential user to start using the shared cars at a mobility hub. They indicate that this need depends on flanking policies and the hub's location.*	**The hub's function in the transportation system** *The hub's function in the transportation system seems to play a big role in the fact that a lot of residents do not choose to use a shared car at the hub.*

TABLE 6-1 COMPARISON BETWEEN THE RESULTS REGARDING THE THEMES THAT ARE RELATED TO "FUNCTIONAL REQUIREMENTS"

Each method concludes that the **walking distance** influences the use of a shared car. This is not surprising because this is widely recognized in previous studies, for example by Liao et al. (2018), Durand et al. (2018), Jain et al. (2021) and it is according to the guidelines in the CROW (2021, Table 8.4/2). The influence of **availability** on shared car usage was not mentioned by 5 or more experts, and therefore did not exceed the threshold (Paragraph 2.2.5). However, it is likely that when asked directly about it the experts would acknowledge the influence of availability on shared car usage because the literature and the residents do so as well. Therefore, the interview structure with open questions could potentially cause this different outcome. The feeling of **social safety** is mainly recognized in foreign studies. It is possible that the safety at a mobility hub in the Netherlands is often not an issue. For example, the mobility hub in the case study was not perceived as unsafe. These factors could therefore explain the different outcomes. It seems that **visibility** of a station-based shared car is not an issue when it is positioned on the street, like most of the shared cars in the Netherlands are. Which could explain why not many previous studies considered it. The question guide that was used for the expert interviews was mainly directed at shared cars at mobility hubs. This could explain the different outcomes between the literature study and the expert interviews, because offering a shared car at a mobility hub could potentially influence its visibility. In addition, only three respondents were unaware of the shared cars at their nearby mobility hub. Therefore, no link could be found between visibility and shared car usage. However given that the experts indicate that this is important, probably a much smaller group of residents would consider using a shared car in case it would be out of sight. Previous literature seems to mainly focus on the location of a mobility hub and does not link this to the adoption of shared cars at the hub. This could explain the different outcome regarding the **hub's function in the transportation system** in the literature study.

PERSONAL REQUIREMENTS		
LITERATURE (threshold: >= 10%)	**EXPERTS (threshold: >= 5 times)**	**RESIDENTS (threshold: >= 10%)**
Personal space	Mentioned by 1 expert	Mentioned by 6% of the residents

TABLE 6-2 COMPARISON BETWEEN THE RESULTS REGARDING THE THEMES THAT ARE RELATED TO "PERSONAL REQUIREMENTS"

In theory the **personal space** component of a car seems to be an important influence. However, the results of the interviews with experts and residents indicate that in case travellers feel the need to use a shared car, the need for personal space will not be a big enough barrier to prevent them from using a shared car.

ASPECTS OF THE JOURNEY		
LITERATURE (threshold: >= 10%)	**EXPERTS (threshold: >= 5 times)**	**RESIDENTS (threshold: >= 10%)**
Occasional needs *The literature seems to suggest that it is important that the shared cars located at a mobility hub fulfil occasional needs, as users often only use it for a specific need at a certain point in time.*	Mentioned by 2 experts	**Occasional needs** *The shared cars at the mobility hub were mainly used for occasional needs. This did not result in structural use. However, it is more likely for this group to use a shared car again in the future because they are now familiar with the concept. The fulfilment of their occasional needs was not linked to the type of shared car that was offered.*
Mentioned in 8% of the articles	Not mentioned by an expert	The process of using a car
Mentioned in 8% of the articles	Mentioned by 1 expert	Travel distance

TABLE 6-3 COMPARISON BETWEEN THE RESULTS REGARDING THE THEMES THAT ARE RELATED TO "ASPECTS OF THE JOURNEY"

Occasional needs seem to be the main reason to use a shared car. However, the experts more often linked the reasons to use a shared car to the function and location of the mobility hub that offers shared cars. They see this as more important, only thereafter the occasional needs would become important. This could explain the difference between the outcomes. The interview with the residents revealed that practical barriers like **the process of using a car** could prevent them from using a shared car at the mobility hub. It seems that the literature and experts underestimate this influence. It could be that the **travel distance** by shared car is not relevant once there is a need to use a shared car, which could explain why the literature and the experts do not mention it. In this case study the residents indicated that because they do not have to travel far, there is no need to use a shared car. This different view could explain the different outcomes.

ATTITUDE OF POTENTIAL USERS 		
LITERATURE (threshold: >= 10%)	**EXPERTS (threshold: >= 5 times)**	**RESIDENTS (threshold: >= 10%)**
Convenience *Some aspects of carsharing can in some cases be more convenient in comparison to owning a car (e.g. access to a car when needed without bearing the associated fixed costs). This seems to have a positive effect on the attitude towards shared cars. In contrast, there seems to be some convenience aspects only associated with owning a car, and not with a shared car (e.g. being independent from timetables).*	**Convenience** *All experts agree that the convenience which users experience influences the use of a travel mode. The convenience of using a shard car at a mobility hub seems to relate to multiple aspects, including making other transport modes in the surrounding area less convenient (e.g. with parking restrictions for private cars).*	**Convenience** *Convenience is mainly linked to the convenience of being able to park a car at their doorstep (i.e. parking convenience). The residents indicate that they are not stimulated to use a shared car at the hub because the hub does not provide additional convenience, as they can park their own car close by.*
Flexibility	Not mentioned by an expert	Mentioned by 0% of the residents

TABLE 6-4 COMPARISON BETWEEN THE RESULTS REGARDING THE THEMES THAT ARE RELATED TO "ATTITUDE OF POTENTIAL USERS"

Each method concludes that the **convenience** travellers experience regarding their mode of transport influences the use of a shared. It seems however that the residents are unaware of the proposed convenience in the literature and mainly link convenience to parking convenience. This is in line with the statements and suggested strategies by the experts. The idea that using shared cars could provide **flexibility**, in comparison to owning a private car, is not recognized by the experts and residents. This is not surprising because the literature already described that potential users seem to be unaware of this potential benefit.

PSYCHOLOGICAL INFLUENCES 		
LITERATURE (threshold: >= 10%)	**EXPERTS (threshold: >= 5 times)**	**RESIDENTS (threshold: >= 10%)**
Behavioural inertia	Mentioned by 1 expert	Mentioned by 9% of the residents

TABLE 6-5 COMPARISON BETWEEN THE RESULTS REGARDING THE THEMES THAT ARE RELATED TO "PSYCHOLOGICAL INFLUENCES"

Five residents mentioned that they feel comfortable by their own routine and therefore do not like to try a shared car (i.e. **behavioural inertia**). The difference between the outcomes could be explained by the fact that for the majority of residents this would not be a barrier. In addition, the interviewed experts are not an expert in the field of psychological influences.

CHALLENGING CHARACTERISTICS OF POTENTIAL USERS 		
LITERATURE (threshold: >= 10%)	**EXPERTS (threshold: >= 5 times)**	**RESIDENTS (threshold: >= 10%)**
Having a family with children	Mentioned by 1 expert	n/a
Higher age	Mentioned by 1 expert	n/a
Low technological affinity	Not mentioned by expert	Mentioned by 0% of the residents
Perceived mobility needs	Not mentioned by an expert	Mentioned by 0% of the residents
Non-multimodal mindset	Not mentioned by an expert	Mentioned by 0% of the residents
Personal believes	Not mentioned by an expert	Mentioned by 2% of the residents
Mentioned in 6% of the articles	Mentioned by 3 experts	Unawareness

TABLE 6-6 COMPARISON BETWEEN THE RESULTS REGARDING THE THEMES THAT ARE RELATED TO "CHALLENGING CHARACTERISTICS"

The keyword search included the key-word "Latent Class Analysis", because of this a lot of reviewed articles mentioned the **characteristics** of travellers. It is however surprising that the literature does not mention **unawareness,** while the residents indicate it an challenging characteristics of potential users. The respondence group in the case study did not include residents with the characteristics: "Having a family with children", "higher age" and "low technological affinity". Surprisingly, without the influence of low technological affinity the booking process was still seen as a barrier. This indicates that lowering the effort to become aware of the booking process is important for everyone that has not yet used a shared car.

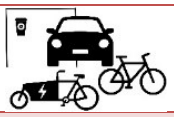
ASPECTS OF A MOBILITY HUB 		
LITERATURE (threshold: >= 10%)	**EXPERTS (threshold: >= 5 times)**	**RESIDENTS (threshold: >= 10%)**
Type of the cars offered *The literature suggests that the type (e.g. difference in mode, quality, electric or size) of shared cars offered at a mobility hub could potentially play a role in the adoption of shared cars.*	**Type of cars offered** *The experts indicate that the offer of shared mobility should resonate with the needs of the residents in the area. However, they do not all agree that this could be accomplished by offering multiple types of shared cars at a mobility hub.*	Mentioned by 4% of the residents
Mentioned in 0% of the articles	The role of additional facilities	Mentioned by 9% of the residents

TABLE 6-7 COMPARISON BETWEEN THE RESULTS REGARDING THE THEMES THAT ARE RELATED TO "ASPECTS OF A MOBILITY HUB"

The literature and experts hint that the **type of a shared car** that is offered could be of influence, this is not established by the residents. It could be that they see a benefit in a variety of shared modes, but do not link such a benefit to a variety of shared cars (i.e. there is not enough variety between different types of shared cars). In addition, the offered shared cars at the mobility hub were not very different from each other. Both could explain the different outcomes. It has to be noted that five residents mention that **additional facilities** would weigh in their consideration whether to use a shared car at the mobility hub. Although, it did not exceed the threshold in this TCA it still somewhat confirms what the experts are saying. The literature does not yet link it to the incentivization of shared cars at a mobility hub, which is not surprising since this was part of the knowledge gap.

6.1.1 The order of importance

The comparison of the results in Table 6-8 till Table 6-10 suggests that the themes that should be considered of primary importance are the subthemes "convenience" and "accessibility", because their reoccurrence exceeded all three thresholds that are set in Paragraph 2.1.4, 2.2.5 and 2.3.3. In addition, the themes that should be considered to be of secondary importance are the subthemes "availability", "occasional needs", "type of cars offered" and "the hub's function in the transportation system". Finally, the themes that should be considered to be of tertiary importance are the subthemes that only exceeded a threshold in one of the TCAs. This indicates that the subthemes are not equally important and therefore their influence on shared car adoption varies. Therefore, the subthemes are divided into three levels. The level of a subtheme indicates to what extent their relationship with shared car usage influences its adoption. From largest influence an shared car adoption to lowest:

- **LEVEL 1: Subthemes that are of primary importance**

Convenience	Accessibility

TABLE 6-8 SUBTHEMES OF PRIMARY IMPORTANCE

The subthemes "convenience" and "accessibility" are mentioned by 10% or more of the articles in the extensive literature study (Chapter 3), are mentioned by more than 5 experts (Chapter 4) and are mentioned by 10% or more of the residents (Chapter 5). This indicates that these subthemes weigh the most in the decision-making process whether to use a shared car, compared to other subthemes.

- **LEVEL 2: Subthemes that are of secondary importance**

Availability	Occasional needs
Type of shared cars offered	The hub's function

TABLE 6-9 SUBTHEMES OF SECONDARY IMPORTANCE

The subthemes "availability" and "occasional needs" and are mentioned by 10% or more of the articles in the extensive literature study (Chapter 3) and are mentioned by 10% or more of the residents (Chapter 5). In addition, the subtheme "the hub's function in the transportation system" has been mentioned by more than 5 experts (Chapter 4) and by 10% or more of the residents (Chapter 5). This indicates that these subthemes weigh more in the decision-making process whether to use a shared car, compared to other subthemes.

- **LEVEL 3: Subthemes that are of tertiary importance**

Safety	Personal space	Flexibility
Visibility	The process of using a car	Travel distance
Additional facilities	Behavioural inertia	Family with children
Higher age	Low technological affinity	Perceived mobility needs
Non-multimodal mindset	Personal believes	Unawareness

TABLE 6-10 SUBTHEMES OF TERTIARY IMPORTANCE

The subthemes "safety", "visibility", "personal space", "flexibility", "the role of additional facilities" and all of the subthemes that relate to "challenging characteristics of potential users" exceeded only one of the thresholds (e.g. either mentioned in 10% or more of the articles or by 5 or more experts). This indicates that these subthemes weigh in a lesser degree in the decision-making process whether to use a shared car, compared to other subthemes.

6.2 CONCEPTUAL MODEL OF INFLUENCING FACTORS ON SHARED CAR USAGE

The identified subthemes in Table 6-1 till Table 6-7 seem to affect shared car usage, because they exceed one or more of the thresholds that are set in Paragraph 2.1.4, 2.2.5 and 2.3.3. These subthemes are therefore independent variables that have a causal relationship with the use of shared cars (i.e. the dependent variable). This relationship could be influenced by aspects of a mobility hub (i.e. moderator variables). Based on the influence of the identified subthemes, suggestions have been made for the guidelines that a mobility hub should fulfil in order to influence these relationships (Paragraph 3.4.1, 4.4.1 and 5.5.1). In addition, the subthemes influence each other's relationship with shared car usage as well. Therefore, the initial conceptual model in Figure 3-17 has been expanded and now presents:

- direct causal relationships between the identified subthemes and shared car usage (**bold arrows**);
- the influences that the identified subthemes have on each other;
- and the influences that the guidelines of a mobility hub have on these relationships.

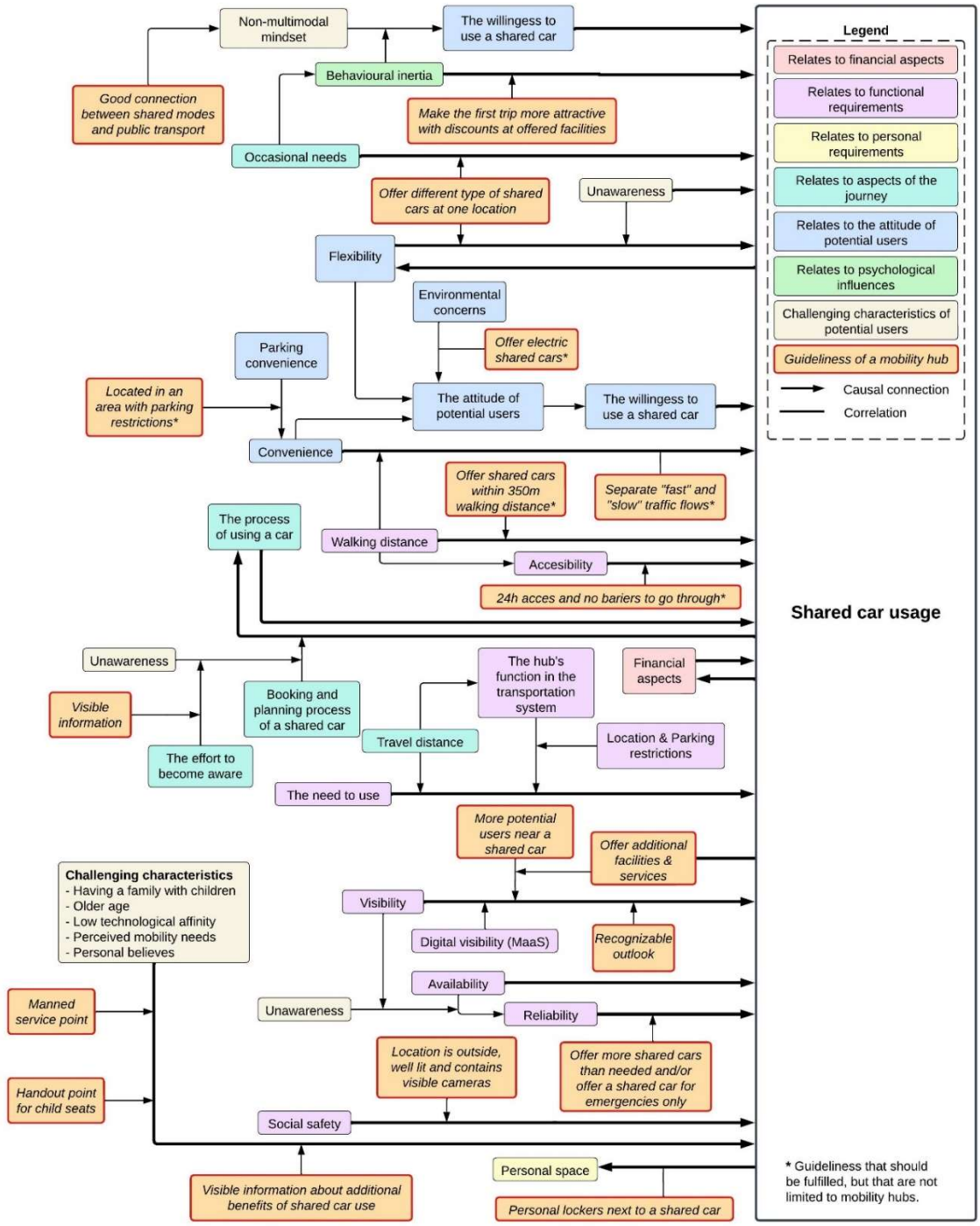


FIGURE 6-1 CONCEPTUAL MODEL SHOWING THE INFLUENCING FACTORS AND RELATIONSHIPS WITH SHARED CAR USAGE

7 CONCLUSION AND RECOMMENDATIONS

This research study showed that there are indeed factors of a mobility hub that can influence the adoption of shared cars located at the hub. The sub questions have answered to what extent a mobility hub can play a role in this adoption (Paragraph 7.1). Recommendations for policy makers and hub developers are provided on how to implement this in practice in Paragraph 0.

7.1 CONCLUSIONS

To gain insight in what kind of aspects of a mobility hub would attract travellers to use a shared car at a mobility hub it is important to get to know the potential users and learn about why they make certain choices regarding their mode of transport. Therefore, the extensive literature study answered which aspects that are related to the use of a shared car could be influenced by aspects of a mobility hub (**sub question 1**);

The choice whether to use a shared car is influenced by tangible factors, such as: financial aspects; functional requirements, aspects of the journey and aspects of a mobility hub and intangible factors, such as: the attitude of potential users, personal requirements, psychological influences and challenging characteristics of potential users are of influence. The relationships between these factors and shared car usage could be influenced by a mobility hub.

Comparing previous studies towards the adoption of shared cars and mobility hub indicated that tangible and intangible factors affect shared car usage, but it did not yet establish the influence of a mobility hub. Therefore, the expert interviews answered to what extend shared cars and mobility hubs currently influence each other and whether this is reflected in the layout of hubs (**sub question 2**);

The main influence of a mobility hub is to attract more potential users to hub by offering additional facilities and services. Increasing the potential users near a shared car could increase its visibility. This is not yet reflected in the layout of the hub, partly because whether residents make use of a mobility hub would mainly depend on the hub's function in the transportation system. The shared car offers an extra travel option at a mobility hub, which could attract more travellers to a hub and with that increase the visibility of other shared or public modes of transport.

The experts indicate that a mobility hub could influence the adoption of shared cars, but do not argue from actual facts or practical experience. Therefore, the interviews with residents answered which aspects of a mobility hub could stimulate them to use a shared car located at their nearby mobility hub (**sub question 3**);

The aspects of a mobility hub that could stimulate the residents to use a shared car at the hub are: offering shared cars that resonate with occasional needs, ensuring availability of shared cars and providing information about the booking- / registration process & the accompanied costs. In addition, flanking policies and the hub's function in the transportation system influence the use of the shared cars that are located at the hub because the residents indicate that there is often no need for them to use a shared car at this mobility hub.

The data that has been collected for each sub question has been analysed with a Thematic Content Analysis (TCA). A TCA is used to analyse the data because there is a gap in the existing literature regarding the subject, the reasoning of experts is not based on actual facts or practical experience with the subject and the residents often have no experience with the mobility hub or answer in possible (future) scenarios. This resulted in reoccurring themes that influence shared car usage (i.e. influential factors).

The conceptual model in Figure 6-1 presents a combined result of the sub questions and shows that in case a mobility hub fulfils certain guidelines it has an influence on the relationships between the influential factors and shared car usage. To which extent a guideline influences these relationships depends on the importance of the subthemes it is based on (Table 6-8 till Table 6-10). Therefore, the guidelines that a mobility hub should fulfil are translated to primary, secondary and tertiary guidelines to determine to which extent a mobility hub could influence the adoption of shared cars located at the mobility hub (**main research question**);

The different levels insinuate to what extent the guidelines of a mobility hub could influence the adoption of shared cars at the hub. By fulfilling the guidelines, a mobility hub can be developed in such a way that it considers the tangible and intangible aspects potential users value to attract more potential users to the hub and lower the barrier of using a shared car located at the mobility hub.

LEVEL 1: - *Based on the subthemes that are of primary importance (*Table 6-8*)* - **If the mobility hub fulfils the primary guidelines it likely has the largest influence on the adoption of the shared cars located at the hub.**

If the mobility hub does not fulfil the primary guidelines it is most likely that potential users will not use a shared car that is located at the hub. This is because these guidelines are mainly based on reasons whether potential users would consider using a shared car. These reasons are therefore not limited to shared cars at a mobility hub. This indicates that when the primary guidelines are not fulfilled potential users do not even consider using a shared car. In case potential users do not consider using a shared car it is not likely that adhering to the secondary and tertiary guidelines of a mobility hub will persuade them to use a shared car at the hub.

LEVEL 2: - *Based on the subthemes that are of secondary importance (*Table 6-9*)* - **If the mobility hub additionally fulfils the secondary guidelines it likely increases the use of the shared cars that are located at the hub.**

In case the mobility hub fulfils the secondary guidelines it secures that the core benefits of shared cars are exploited. This is because these guidelines are mainly based on the reasons "why" shared cars are used. Moreover, these guidelines intensify aspects that resonate with reasons to use a shared car and with that make the use of a shared car at the hub more likely.

LEVEL 3: - *Based on the subthemes that are of tertiary importance (*Table 6-10*)* - **If the mobility hub also fulfils the tertiary guidelines it is likely that more potential users are incentivized to consider the use of a shared car at the hub.**

This is because these guidelines for a mobility hub are based on aspects that could lower barriers regarding the use of shared cars and on additional benefits of a mobility hub that weigh in the decision-making process whether to use a shared car.

The different levels insinuate to what extent the guidelines of a mobility hub could influence the adoption of shared cars at the hub. Recommendations are made for the guidelines a mobility hub should fulfil in order to incentivize the use of shared cars at the hub in Paragraph 0.

7.2 RECOMMENDATIONS FOR POLICYMAKERS AND HUB DEVELOPERS

Considering the influences of the identified subthemes in this qualitative research study, the primary, secondary and tertiary guidelines a mobility hub has to fulfil in order to play a role in the adoption of shared cars located at the hub are suggested in this paragraph. In case mobility hubs are developed without considering the suggested guidelines, the adoption of shared cars at a mobility hub will remain in a larger degree uncertain. The level of a guideline suggests to what extend the mobility hub could influence the adoption of shared cars at the hub.

7.2.1 PRIMARY GUIDELINES FOR A MOBILITY HUB

Comparing the results of the extensive literature study, expert interviews and interviews with residents indicated that the subthemes "convenience" and "accessibility" have the largest influence on the adoption of shared cars at a mobility hub. Based on these subthemes, recommendations are made for the primary guidelines of a mobility hub in Figure 7-1. It is believed that if a mobility hub adheres to these guidelines it can play a relatively large role in making the adoption of shared cars at the hub more likely.

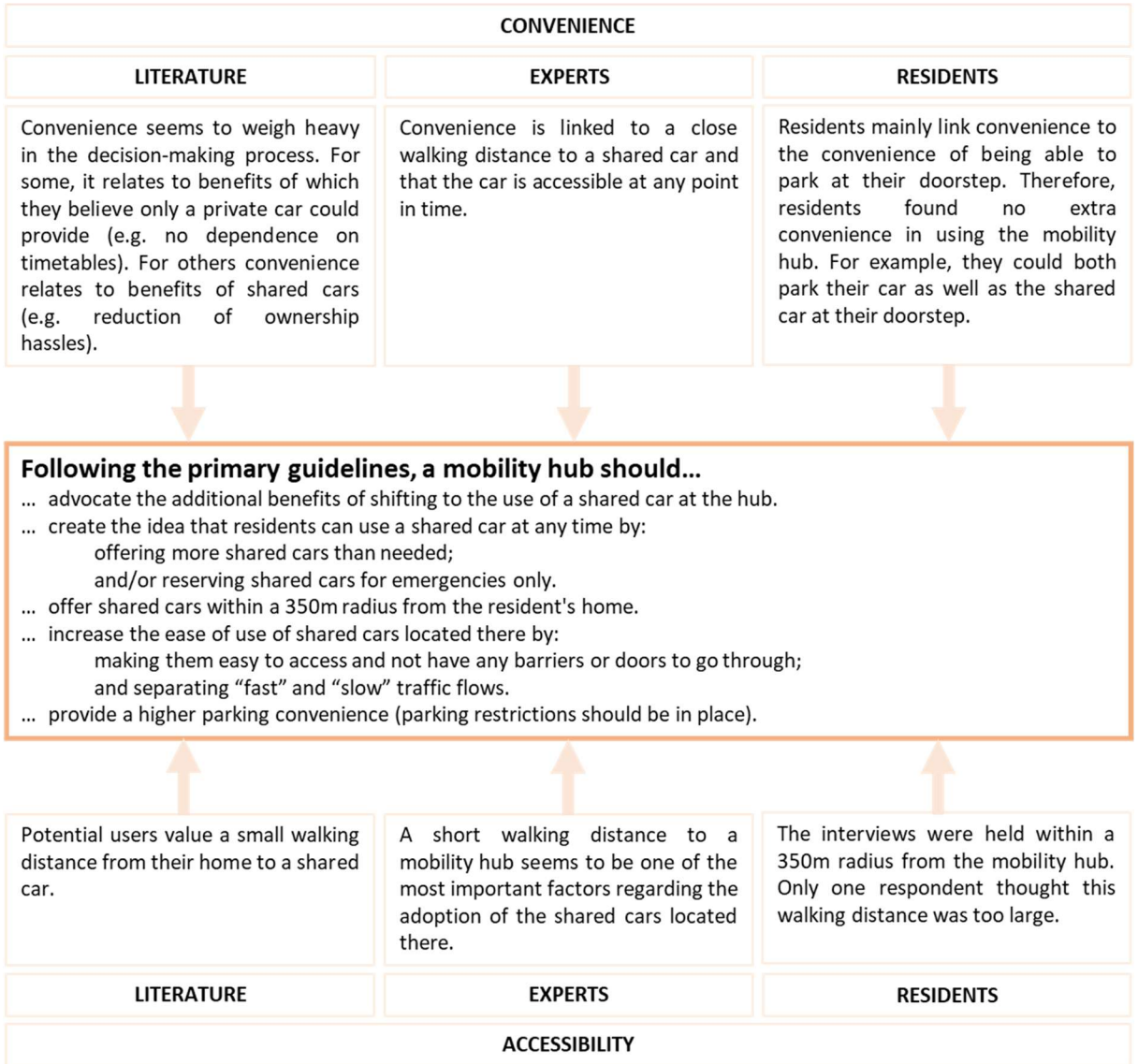


FIGURE 7-1 RECCOMANDATIONS FOR PRIMARY GUIDELINES

7.2.2 SECONDARY GUIDELINES FOR A MOBILITY HUB

Comparing the results of the extensive literature study, expert interviews and interviews with residents indicated that the subthemes “availability”, “occasional needs”, “type of shared cars offered” and “the hub’s function in the transportation system” have more influence on the adoption of shared cars at a mobility hub. Based on the influences of these subthemes, recommendations are made for the secondary guidelines for a mobility hub in Figure 7-2. It is believed that if a mobility hub fulfils these guidelines it can play a considerable role in making the adoption of shared cars at the hub more likely.

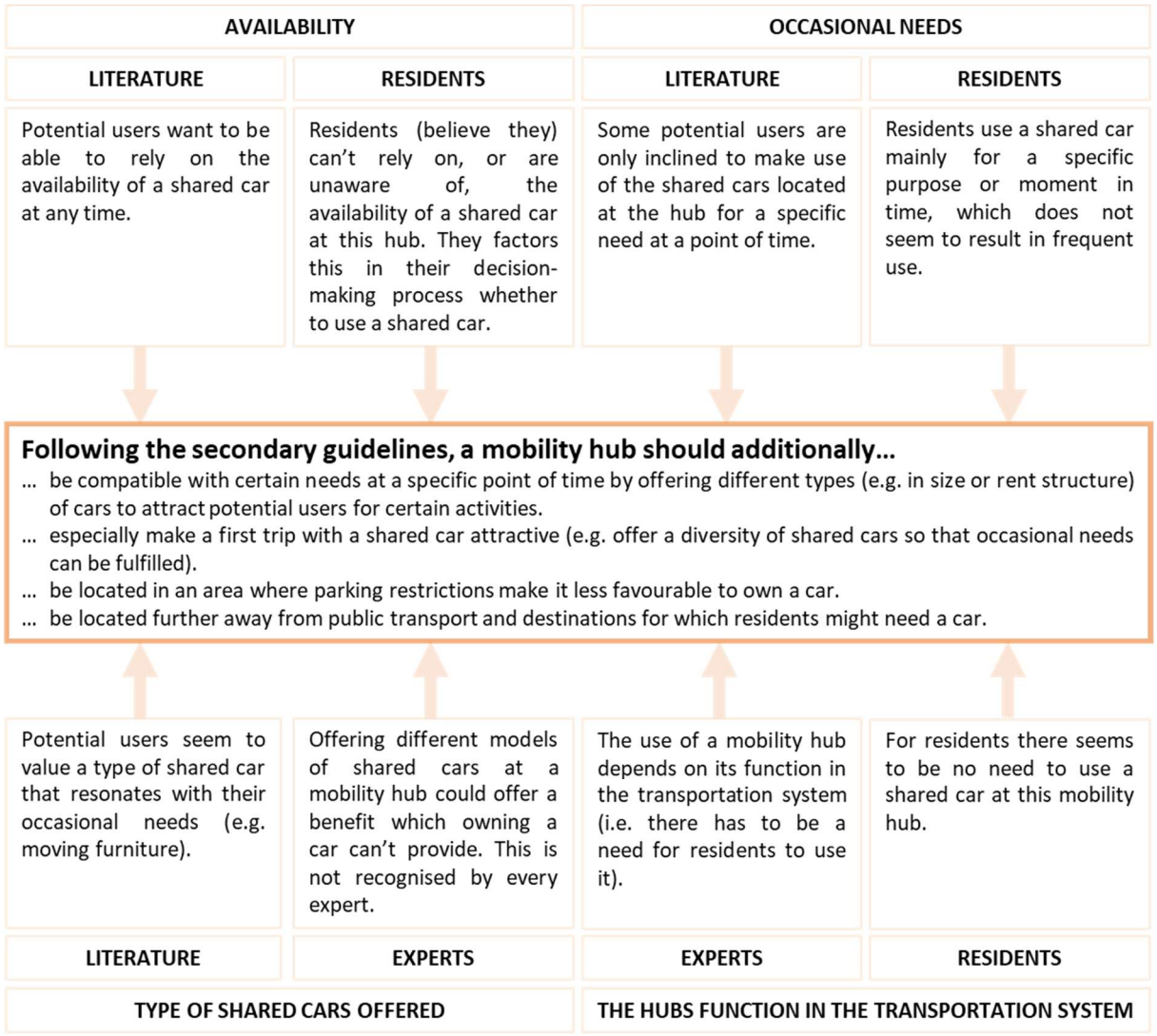


FIGURE 7-2 RECCOMANDATIONS FOR SECONDARY GUIDELINES

7.2.3 TERTIARY GUIDELINES FOR A MOBILITY HUB

Comparing the results of the extensive literature study, expert interviews and interviews with residents indicated that the subthemes in Figure 7-3 influence the adoption of shared cars at a mobility hub. Their importance comes from the fact that the times the theme reoccurred exceeded a certain threshold (e.g. reoccurring in 10% or more of the articles or mentioned by more than 5 experts). However, the importance of these subthemes has not been acknowledged by the other two TCAs. Based on the influences of these subthemes, recommendations are made for the tertiary guidelines for a mobility hub in Figure 7-3. It is believed that if a mobility hub fulfils these guidelines, it can play a role in making the adoption of shared cars at the hub more likely.

LITERATURE				
Safety	*Personal space*	*Flexibility*	*Behavioural inertia*	*Having a family with children*
Potential users seem to value the feeling of social safety at a mobility hub and the safety of the vehicles.	Potential users seem to value their personal space and by definition the shared car is not personal.	Flexibility is valued, but mainly linked to owning a car. In theory a mobility hub could add extra flexibility, potential users seem to be unaware of this.	It is likely that potential users rather choose for a mode of transport they have already used.	Households with children face practical challenges which makes it more difficult for them to use a shared car.
Higher age	*Low technological affinity*	*Perceived mobility needs*	*Non-multimodal mindset*	*Personal believes*
Older generations are generally more hesitant to join a carsharing scheme as they weigh ownership in higher regard and have a lower technological affinity.	People of higher age seem to have a lower technological affinity which can be a hindrance to use a shared car.	Some potential users have lifestyles which they think can only be let if they own a car. This is represented in their perceived mobility needs.	Potential users who have a non-multimodal mindset will be harder to attract to shared car use.	It seems that individual perceptions have a large effect in the decision-making process whether to use a shared car.
EXPERTS		**RESIDENTS**		
Visibility	*The role of additional facilities*	*The process of using a car*	*Travel distance*	*Unawareness*
Whether the shared cars are visible at the mobility hub seems to play a large role in their adoption.	Additional facilities at a hub could attract residents to it, which increases the visibility of the shared cars there. In addition, it offers a business case to make the hub more profitable.	Residents see the booking process of a shared car as a barrier. Either because they find it too complex or because it is unknown to them.	For residents there seems to be no need to use a shared car at this mobility hub because of short travel distances.	The effort to become aware of the booking process and the accompanied costs are seen as a barrier by the residents.

Following the tertiary guidelines, a mobility hub should additionally…

… be a space where people feel safe around day and night.
… decrease the burden of using a shared car with children (e.g. by handing out child seats)
… have a manned service point where people with low technological affinity can get help with the booking process.
… increase the visibility of the shared cars located there by:
  having a uniform and recognizable appearance;
  being visible on MaaS-apps
  offering additional facilities to attract potential users to the hub.
… provide easily accessible, clear and visible information (e.g. with an information sign) regarding the booking process and the costs of a shared car per provider.

FIGURE 7-3 RECCOMANDATIONS FOR TERTIARY GUIDELINES

8 DISCUSSION

The Thematic Content Analysis (TCA) identified reoccurring themes in the related literature, in the transcripts of the expert interviews and in the answers given by the residents in the single case study. With these analyses the sub questions could be answered and the results could be compared to form a main conclusion. However, the method did not make it possible to compare all relevant aspects, because subthemes were only considered to be valued when they exceeded a certain threshold. Frequent occurrence could indicate greater importance, but it might simply reflect greater willingness or ability to talk at length about the topic (Vaismoradi et al., 2013). Therefore, it could be that a subtheme that did not exceed the threshold, is of value as well.

The results of the extensive literature can be generalized for other mobility hubs in the Netherlands, because data saturation has been reached after reviewing fifty scientific articles that are related to the subject. However, the extensive literature study also considered research studies from foreign countries. The results regarding what potential users seem to value could therefore deviate a little from the results in the interviews with the experts and the residents. Therefore, the results of the interviews with the experts and the residents could be more representative for the layout of mobility hubs in the Netherlands.

The results of the expert interview suggest a generalization of the results, because after six interviews no new insights were provided. However, this should be confirmed by interviewing more experts with different backgrounds. In addition, the experts often found it difficult to comment on which guidelines a mobility hub should adhere to in order to make the use of a shared car located at the hub more attractive. This is because they were used to think about what could influence the adoption of shared cars separately from the influence of a mobility hub. Talking about this subject however did provide useful insights because of the Thematic Content Analysis (TCA).

The result of the single case study cannot be generalised, because it considers a specific situation. However, the outcome of the single case study was not surprising and mostly in line with the results of the extensive literature study and the expert interviews. The reason for this could however partly depend on the fact that the interview guide contained a certain bias. The question were initially open, however not many residents seemed to know what influences their decision-making process whether to use a shared car at the mobility hub. Therefore, they were presented with a list of possible reasons that resulted from the extensive literature study and expert interviews. Although, it must be noted that in case they did not see any of the presented reasons as an influence they could also choose none of the options. This makes their choice for certain options still relevant in this qualitative research study.

The results indicate that aspects of a mobility hub could influence relationships between independent variables and shared car usage (i.e. the dependent variable). The role of a mobility hub as a moderator variable was unknown before this research study was done. Therefore, this research study contributes to decreasing the knowledge gap in Paragraph 0. In addition, by interviewing the experts and residents this study confirms the researchers expectation that there could be a link between the adoption of shared cars at a mobility hub and the offered facilities. This research study has laid a foundation for the role of a mobility hub in the adoption of shared cars at the hub that is based on related literature and interviews with experts and residents. However, this foundation should be strengthened by additional expert interviews and multiple case studies towards mobility hubs of similar size as the one used in this single case study.

The research mainly focussed on the positive effects of a mobility hub on shared car adoption. Therefore, it contained a bias towards the positive effects which could cause that potential negative effects of incentivizing shared car usage are overlooked. In addition, it is beyond the scope of this study to examine the full weight of financial aspects that influence shared car usage at a mobility hub. Moreover, the reader should bear in mind that the single case study is mainly based on residents that are between the age of 18 till 35. Therefore, the outcome of the single case study does not represent the entire group of potential users.

The results of this research study should be used as a basis for the layout of a mobility hub to better connect the needs and preferences of the potential users, and with that offer more security to shared car providers that their shared cars at that location will be used. In case mobility hubs are developed without considering the suggested guidelines, the adoption of shared cars at a mobility hub will remain uncertain in a larger degree. This is in line

with the study of Claasen (2020), who described that mobility hubs must satisfy the guidelines of the residents to live up to their potential.

The experts did give an indication regarding the achievability of suggested guidelines. However, there is a lack of information regarding the achievability of the suggested guidelines a mobility hub has to adhere to, Chapter 7. It was not the goal of the interview to obtain knowledge regarding the achievability of the guidelines. Which caused that too little information was collected to include in this research paper. The experts indicated that they do have knowledge regarding this subject. For example, it is indicated that the achievability of creating a sustainable business case for a mobility hub increases when multiple functions are added to the hub. Therefore, for future research an additional round of interviews with these experts regarding this subject is advised, using a different interview guide.

Of all the interviewed residents only one was between the age of 51 and 65, who did not use the shared car because of mobility issues. Therefore, no link could be made between higher age and the barrier of low technologically affinity. In addition, no link could be made between the characteristic “having a family with children”. It is unlikely that this is not an influential factor, as it is more likely that no resident with a family with children has been interviewed. Therefore, for future research it is advised to compliment this research study with interviews with residents who have a family with children and/or are above the age of 35, using the same interview guide as in Appendix F.

In this moment and the years to come many Dutch cities and policy makers are looking to change the mobility system by developing mobility hubs. Implementing mobility hubs have the goal to use the limited available space more efficiently and simultaneously increase the liveability in the cities. In addition, the mobility hub plays an important role in decreasing the ownership of private cars and with that also decrease the limited space they use. The shared cars at a mobility hub play an important role in this. Therefore, it is important to know how the adoption of these shared cars could be incentivized. This study presents a guideline for mobility hubs in residential areas, and with that could be a basis for further studies towards other types of mobility hubs (e.g. corridor hubs).

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APPENDIX A: METHOD OF THEMATIC CONTENT ANALYSIS

The following method, as explained by Anderson (2007) has been followed to identify the reoccurring themes:

1. Before beginning a Thematic Content Analysis (TCA), make multiple copies of interview transcript (or other extant text, including post-interview notes) as relevant and stipulated in your Methods Chapter.
2. Mark with a Highlighter (real or electronic) all descriptions that are relevant to the topic of inquiry. Criteria for "relevant" descriptions should be included in your Methods Chapter.
3. From the highlighted areas, mark each distinct unit of meaning. Meaning units are separated by a break or change in meaning. Erase on the side of too many units. However, be sure to retain all information relevant to understanding a meaning unit within the meaning unit. Otherwise, relevant information will be disconnected from source as the TCA continues. Units may vary in text length.
4. Cut out units and put similar units together in a pile. (On a Word file, copy and paste on to another document.) Code each unit, for example. 1-16 for interview # 1, page 16 (or by text line number).
5. Label each pile as initial categories (themes) using key words or phrases copied from highlighted texts. Use your own categories sparingly. Revise categories as you continue to code data.
6. If obvious information is missing from text, identify categories that are missing, for example, "no affect."
7. Go through the entire interview transcript identifying distinct units, grouping and regrouping similar and dissimilar units, and re-labeling categories as you go along. Use your own categories/themes sparingly, retaining words copied from the meaning units being described.
8. Read through all meaning units per category and redistribute units as appropriate. Re-label categories as appropriate. Collapse or subdivide categories as appropriate.
9. After a few days, reread the original interview transcript or text without looking at your units or categories.
10. Return to meaning units and categories made on the first pass, and reconsider each unit and category. Redistribute units as appropriate, considering carefully whether your units are too small or too large. Re-label as appropriate. Collapse or subdivide categories as appropriate considering carefully whether your categories are too small or too large.
11. Look over your categories as a whole. Consider whether you have too many categories (or less likely, too few) to render meaning to your highlighted texts given your topic. If so, return to # 10.
12. For each additional interview transcript (or other texts), use the Thematic Content Analysis (TCA) as above.
13. When all TCAs are complete, read each TCA separately. Then, while retaining meaning units, combine categories/themes for all interview transcripts and notes. Collapse or subdivide categories as appropriate. Re-label categories as appropriate. Err on the side of having too many categories. Err on the side of retaining labels for categories that are identical or similar to the words in the interview transcripts.
14. After a few days, reread your total categories as a whole. Consider whether you have too many (or too few) categories to make overall sense of the interview transcripts given your topic.
15. Redo all the instructions above until you are satisfied that the categories reflect the interview transcripts as a whole. Once you are satisfied, your categories are themes and you are done with the TCA for this study.

APPENDIX B: IDENTIFICATION OF REOCCURRING THEMES

The following Table presents the identified themes at each step of the thematic content analysis.

Step in TCA	Themes after # steps
Step: 5 **Themes: 35**	Attitude, Behavioural inertia, Car dependence, Car ownership, Clusters Control, Convenience, Emotions, Environment, Experience, Financial, Freedom Having a family with children, Influence on switch, Influence on vehicle ownership reduction, No effect, Normative believes, Occasion, Parking, Perceived needs, Personal believes, Possible strategy, Preferences coming from Maas, Privacy, Reliability, Safety, Subjective norms, Switch influence coming from Maas, Switch negative, Switch positive, Travel behaviour, Unawareness, V2G, Vehicle preference, Willingness
Step: 8 **Themes: 83**	Accessibility, Added value, Age, All-inclusiveness, Attitude, Availability, Behavioural inertia, Biased perceptions, Characteristics of car owners, Characteristics that seem to have no effect on adoption, Choice freedom, Comfort, Compatibility with personal lifestyle, Control, Convenience, Costs, Cost-savings, Diversity of vehicles, Driving distance, Education level, Emergency, Emotions, Environmental concerns, Financial aspects, Fixed costs, Flexibility, Freedom, Frequent car users, Functional needs, Gender, Having a family with children, Income, Influence on adoption, Influence on switch from private car to shared car, Influence on vehicle ownership reduction Insurance / Liability, Location of the shared car (station based / free-floating) Mobility demand, Mobility issues, Non-multimodal mindset, Normative believes, Not perceived as green transport mode, Occasion, Occupation, P2P as more environmental friendly, Parking convenience, Parking pressure, Perceived needs Personal believes, Personal space, Preference for carsharing mode, Previous experience, Process of using a car, Psychological, Psychological comfort Reduction of ownership hassles, Reliability, Safety, Satisfaction, Saving time, Security Service, Service coverage, Social pressure, State of the hub, State of the vehicles, Status, Subjective norms, Sustainable mindset, Technological affinity, The hubs connection to the transportation system, Travel behaviour, Travel destination Travel distance, Travel socialisation, Travel time, Type of car, Unawareness, Vehicle preference, Vehicle settings, Vehicle to grid (V2G), Visibility of the hub, Walking distance
Step: 11 **Themes: 51**	(Non-) multimodal mindset, Accessibility, Accompanied logistics, Higher age, Behavioural- / psychological inertia, Comfort, Compatibility with personal lifestyle, Control, Convenience, Diversity in vehicles, Educational level, Emotions, Environmental concerns, Financial aspects, Flexibility, Gender, Having a family with children, Location of the shared car (station based / free-floating) Manned service point, Mobility issues, Normative believes, Occasion, Occupation Parking convenience, Perceived needs, Personal believes, Personal space, Previous experience, Presence of additions for shared cars, Reduction of ownership hassles Availability, Safety, Saving time, Service coverage, Social pressure, State of the hub State of the vehicle, Status, Subjective norm, Technological affinity, The hub's connection to the transportation system, The process of using a car, Travel distance, Travel socialisation, Travel time, Type of cars offered, Unawareness, Vehicle preference, Vehicle settings, Vehicle to grid (V2G), Visibility of the hub
Step: 14 **Themes: 9**	Aspects of the journey, Attitudes of potential users, Challenging characteristics of potential users, Financial aspects, Functional requirements, Personal requirements, Psychological influence; The process of using a car, Aspects of a mobility hub

APPENDIX C: INTERVIEW GUIDE FOR EXPERTS

The following questions (in Dutch) were asked during the semi-structured interview with the experts. The bolted questions are main-questions that have been asked to all respondents. The other questions were optional.

1. **Wat beïnvloed volgens u het gebruik van een mobiliteit hub?**
    a. Waarom beïnvloed dit het gebruik van een hub?
    b. Voor wie is dit belangrijk?

2. **Wat beïnvloed volgens u het gebruik van een deelauto?**

3. Waar wordt het potentiële gebruik van een mobiliteit hub op gebaseerd?

4. **Welke rol speelt volgens u de potentiële gebruiker in het ontwerp, locatie en aanbod van een mobiliteit hub?**
    a. De potentiële gebruiker wordt vaak omschreven als de groep waarbij de kans het grootst is dat ze een hub gaan gebruiken, maar hoe zit het met de doelgroep dat nu in een privé auto zit?
    b. Welke bijdrage heeft u zelf geleverd aan het laten aansluiten van het ontwerp, locatie en aanbod van de hub op de potentiële gebruiker?

5. Welke rol zou de deelauto in een mobiliteit hub kunnen innemen?

6. **Welke rol heeft volgens u de mobiliteit hub in het deelauto gebruik nu?**
    a. En welke rol zou dat volgens u in de toekomst kunnen / moeten zijn?

7. Voor welke doelgroep zouden mobiliteit hubs met deelauto's worden aangelegd?

8. **Is de doelgroep waarvoor mobiliteit hubs met deelauto's worden aangelegd bij u bekend?**
    a. Zo ja, wat is dit profiel?
    b. Als de doelgroep afwijkt van de literatuur: waarom is de doelgroep nu niet de mensen die een privé auto gebruiken?

9. Welke rol spelen eventuele negatieve effecten van de mobiliteit hub in het ontwerp proces?

10. Heeft u zelf wel eens een (wijk)hub gebruikt, en zo ja hoe was de ervaring?
    a. Weet u of er in de buurt van uw woonlocatie een mobiliteit hub is?

11. **Wat zou een hub volgens u moeten bieden zodat een deel auto daar in de toekomst voordeliger is dan een privé auto?**

12. **(Figure C-1) [Laatste 15min]**
    Hoe zwaar acht u dat de volgende aspecten invloed hebben op het gebruik van een deelauto op een mobiliteit hub?

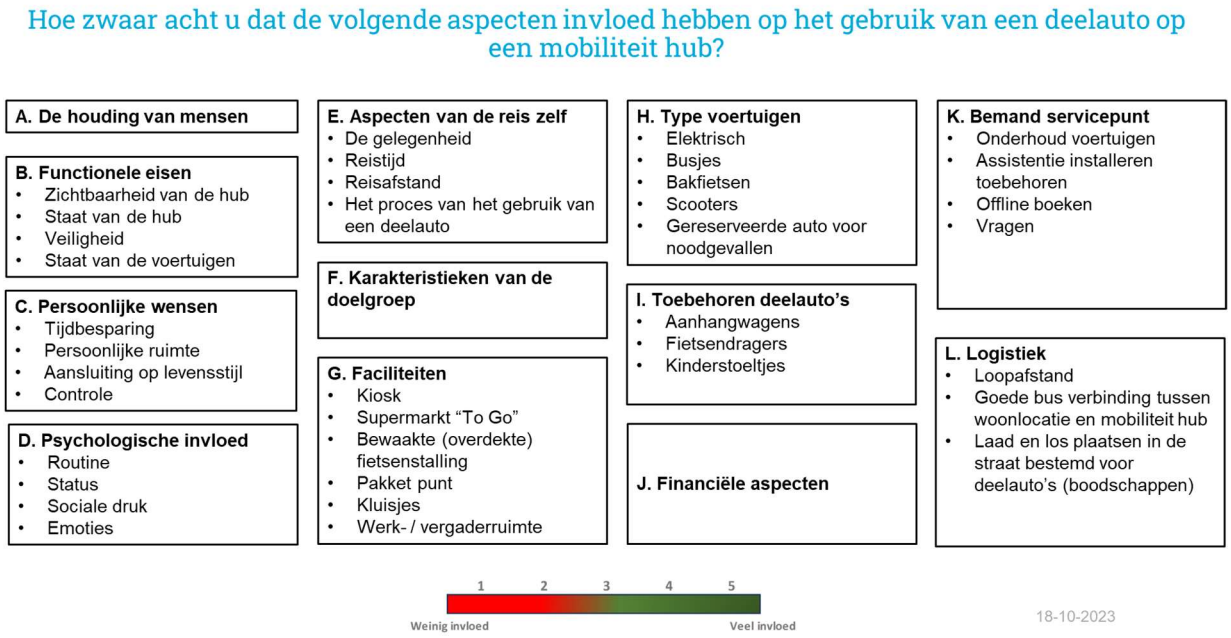

FIGURE C-1 THIS FIGURE WAS SHOWN TO THE RESPONDENTS TO DETERMINE HOW THEY WOULD WEIGH THESE FACTORS

APPENDIX D: RESULT OF EXPERT INTERVIEW

In this Appendix the combined results of the interviews with the experts can be found.

WHAT WOULD INFLUENCE THE USE OF A MOBILITY HUB ACCORDING TO EXPERTS?

Regarding this subject respondent 1 mentions that it is good to realise that in many cases the Dutch government and the involved market parties do not know yet when a mobility hub is marked as successful. This being said, the aspects that does seem to influence the adoption of a mobility hub are according to the experts: flanking policies; additional facilities; the location; the type of vehicles offered; the walking distance; the visibility of the hub and peoples current / preferred travel behaviour.

FLANKING POLICIES

According to respondent 1 a mobility hub will only become successful with flanking policies such as parking restrictions or a prohibition of free-floating shared vehicles in the area. This is supported by respondent 4, 5 and 6. Respondent 4 and 6, mentions that people will only start to use a mobility hub if they have a reason to do so. Respondent 6 calls this need the minimal condition for using a mobility hub and mentions that secondary the stacking of functions will become important. He also stipulates the hypothesis that potential users of a mobility hub would prefer not to transfer between modes of transport. Given that the private car is a convenient way for such a unimodal journey, according to 6, the use of a mobility hub depends on making this journey less convenient (e.g. with parking restrictions). In addition, he says that these people would probably prefer to switch with a great ease between transport modes once at a mobility hub (e.g. from bus to shared car).

ADDITIONAL FACILITIES

Regarding the possibility of adding facilities to a mobility hub, respondent 4 could imagine that this would attract residents to the hub in case these facilities are not already available in the neighbourhood. Respondent 1, for example, assumes that it would be more attracting, in comparison to “gas” stations, for potential users to charge their electric vehicle at a mobility hub that contains facilities such as a postal service, a small drugstore, a dry-cleaning service or seats to meet (i.e. work-/ conference room). This would make the hub more attractive for potential users and is a key element for exploiters in case there are no paid parking places at that location (respondent 1). However, respondent 4 mentions that in this case the residents would come to the mobility hub because of the facilities and not to travel with the shared car located there. This could however, according to 4, increase the chance of the residents using the shared car located at the mobility hub as this increases the visibility of the car as the residents are at the hub. For example, respondent 4 thinks that adding charging stations for private vehicles to a mobility hub could attract residents to come to the hub in case they experience difficulties with getting these stations in their own street.

LOCATION

Respondent 1 mentions that the location of the mobility hub is also important as the usage of its additional services depend on it as well. For example, if the mobility hub is located in a low-income neighbourhood the residents will not be drinking an expensive cup of coffee there (respondent 1). Besides the facilities, according to respondent 2 the offered vehicles at a mobility hub should be in line with the needs and preferences of its potential user, which are different in certain areas.

TYPE OF VEHICLES OFFERED

As additional benefit to a mobility hub (e.g. regarding the business case or the travel occasion), according to respondent 6, the hub could offer room for rental cars as well instead of offering only shared cars.

WALKING DISTANCE

In addition, the type of vehicle offered at a mobility hub determines to some extent the willingness of the potential user to walk a certain distance (2). According to 2, people are more willing to walk a larger distance to a shared car than they are to a shared bicycle. The walking distance to a mobility hub is seen by respondents 2 and 4 as an important factor regarding whether residents will make use of it. Respondent 4 suggests that, if a shared car is located at a closer distance in comparison to a shared car located at a hub, the walking distance remains the most important factor and not the possible additional benefits (e.g. facilities and services) at the mobility hub.

Visibility

Respondent 4 and 6 mentions that a mobility hub which offers facilities that make it a nice place to frequently reside could attract potential users as this would increase the visibility and increase the awareness of the shared cars located there. This is important because the awareness amongst residents regarding the option of shared cars in their neighbourhood remains an important factor in the adoption of shared cars, according to respondent 4. A uniform style is developed to increase the recognisability of mobility hubs, respondent 2 thinks this will make a hub more attractive. However, whether this effect actually does occur still has to be researched. Respondent 5 makes the remark that besides physical visibility, it is important that a mobility hub is digitally visible (e.g. is shown on a MaaS-app).

Travel behaviour

According to respondent 4 and 6, getting people to at least try a shared car is an important first step in its adoption. This could be at moments that a potential user is in between cars (e.g. their private car is being repaired). According to respondent 6, small behavioural interventions at these moments when people are sensitive for change (e.g. a new home) could steer people to use a mobility hub.

In addition respondent 4 mentions that the use of a mobility hub is connected to the degree in which residents are used to not use their own car (e.g. when people use the public transport).

What would influence the use of a shared car according to experts?

The aspects that do seem to influence the adoption of a shared car are according to the experts: the type of car offered; the awareness; the accessibility; the visibility; financial aspects; parking restrictions; the value of personal space; the occasion and the travel distance.

Type of car offered

Respondent 5 mentions that the quality (e.g. the latest model) of a shared car in comparison with the ownership of a car could be attractive for potential users. However, according to him this is of secondary importance as the main reason to use a shared car remains that there is a certain need (e.g. due to parking restrictions). It is important to offer a diversity of shared cars, that is why the organisation of respondent 3 offers larger and smaller types. On the subject of electric cars, it seems to respondent 2 and 3 that shared electric cars nowadays can be more of a barrier instead of making car sharing more attractive.

Awareness

Respondent 3 thinks that providing information regarding the location and availability of shared cars has a large influence on the adoption of shared cars and in lesser degree providing information regarding (future) parking restrictions.

Accessibility

According to respondent 6 a shared car should replicate the freedom that a private car offers, which is that it is always available and at walking distance from their house. This convenience of a small walking distance is further stipulated by respondent 3, who also states that the shared car should be accessible 24 hours a day. Moreover, there should be no barriers (Dutch slagbomen) and no doors to go through before reaching the shared car, because some should be able to get in and go, just like when they would use a private car (respondent 3).

Visibility

It is stated by respondent 3 that the visibility is an important factor regarding the adoption of the shared car by residents. This visibility would be less in case (existing) parking garages are transformed to mobility hubs. The last is supported by respondent 6, as he mentions that the benefit of a shared car located on the side of the road is its visibility.

Financial aspects

According to respondent 4, 5 and 6, financial aspects play a role in the adoption of shared cars, and a notion is made that private car owners are often unaware of the total costs of ownership and therefore might be ignorant of the financial benefits a shared car could provide. Respondent 6 thinks that the awareness of the cost benefits amongst potential users could play a role in making the use of a shared car more attractive. He mentions that a mobility hub could offer a place (e.g. a sign) to make people aware of these benefits. Respondent 6 thinks that

the awareness of the cost benefits amongst potential users could play a role in making the use of a shared car more attractive. He mentions that a mobility hub could offer a place (e.g. a sign) to make people aware of these benefits.

Parking restrictions

The influence of parking restrictions for the adoption of shared cars is mentioned by respondent 5.

The value of personal space

Respondent 6 mentions that the potential users who are currently using their private car value the personal space of it and the status it gives them.

The occasion

Respondents 3 and 6 think that the occasion (e.g. groceries or shopping at IKEA) sometimes determines the need for a shared car in case people do not own a car.

Travel distance

The travel distance does influence the use of a shared car according to respondent 4, as she mentions that for short distances private vehicles are preferred as in comparison to larger distances a shared car would cost a lot.

The aspects on which the potential use of a mobility hub is predicted according to experts

The aspects on which the potential use of a mobility hub is predicted is not known by respondent 6, but he mentions that for the sustainability of a mobility hub it could be beneficial to leave room for up- or downscaling of the hub.

The role of the potential users in determining the design, location and offered vehicles according to experts

According to the experts the role of the potential users depends on: the role of the provider; the availability of space and the size of the hub. The main role of the potential user is that developers know that they do not prefer large walking distances. Social-economic statuses could do not seem to play a role yet, but could be an indicator for the hub's success.

The role of the provider

The first remark regarding this subject respondent 1 makes is that in most cases the provider plays a big role in the type of shared vehicles that are provided at a mobility hub. Respondent 3 (organisation: shared car provider) mentions that it is good to have a diversity of offered cars so it connects to the different preferences of their users. However, according to her the diversity should not be too broad as people want to know what to expect.

Walking distance

According to respondent 1 when looking at the location of the mobility hub and the preferences of its potential users, the preference of a small walking distance is taken into account the most.

Scarcity of space

Regarding the design an important factor is the scarcity of space in existing neighbourhoods, according to respondent 1. Respondent 4 thinks that, the role of the potential user of a mobility hub in its design and offered vehicles depends on the kind of hub and its location. She mentions that their needs and preferences, are not always taken into account regarding the hub's design or offered vehicles and its location is mostly determined by the availability of space.

Social- economic status

Respondent 1 mentions that nowadays during the development of mobility hubs the incomes or social-economic statuses of the residents are not yet taken into account. He says that these are factors that can predict in some extend the usage of a mobility hub and that therefore the role of the potential user might be still insufficient.

THE SIZE OF THE HUB

Respondent 2 mentions that for the larger hubs the potential user plays a role in the design, location and offered vehicles at the hub. However according to respondent 2, the potential user does not play a role in this regarding smaller hubs, as these are mainly determined by the available space.

THE ROLE OF A SHARED CAR IN A MOBILITY HUB ACCORDING TO THE EXPERTS

The experts do think that a shared car could play a role in a mobility hub and define this role as an additional benefit to place where people come together (e.g. stations).

NUMBER OF CARS OFFERED

Respondent 3 (shared car provider) thinks that the shared car could play a role in a mobility hub, but as already mentioned only if it is 24 hours accessible at that hub. In addition, she mentions that it would be realistic if 2 or 3 cars would be stored at a neighbourhood mobility hub and that 10 cars at once would probably not be doable for them given the investment costs. Moreover, based on the experience of her organisation those cars would not be used.

AS ADDITIONAL BENEFIT

Respondent 5 believes that mobility hubs are being located at places where travellers are likely to come together (e.g. stations) and that in that case adding a shared car to the hub would provide a benefit for its users.

THE CURRENT ROLE OF THE MOBILITY HUB IN THE ADOPTION OF SHARED CARS ACCORDING TO EXPERTS

Several experts believe that a mobility hub could play a role in the adoption of shared cars by providing opportunities to make it more attractive to go there. However, some experts doubt that a mobility hub could play a role in the adaptation of shared cars. If the mobility hub plays a role it would be based on its function in the mobility system, which differs per location.

PROVIDES ADDITIONAL OPPORTUNITIES

According to respondent 5, the role of a mobility hub in the use of a shared car located there depends partly on the way a hub is designed. Respondents 2, 4 and 5 imagine that in case additional facilities are added to the hub (e.g. a postal service) it could offer benefits (e.g. the concentration of facilities) which would make it more attractive for users to make use of the mobility hub. Moreover, respondent 5 believes that if a hub is more attractive that it would increase the usage of shared cars located there. For example, the availability and workability of loading infrastructure is currently a problem regarding the implementation of electric shared cars (respondent 3). In case a mobility hub could make it possible to provide good and reliable charging stations, then it could be interesting for to park their shared cars there, according to respondent 3.

According to respondent 4 a mobility hub could create extra visibility of shared cars, but this would only be beneficial to attract users for the first time.

THE ROLE OF A MOBILITY HUB IS DOUBTED

Respondent 2 does not see the mobility hub as a way to increase the attractiveness of shared cars located there and mentions that this potential effect would be more interesting for the providers of the shared cars. Respondent3 does not yet recognise that a neighbourhood mobility hub would have additional benefits either regarding the attractiveness to use a shared car located there. The main reasons for this, given by respondent 3, are that the walking distance to a mobility hub could be larger in comparison to an individual parked shared car and that the shared car could become less visible. Moreover, with the current strategy of the organisation of respondent 3 they do not need a mobility hub. For example, the possibility of offering a diversity of shared vehicles at a mobility hub is not seen by respondent 3 for as a benefit in case the vehicles are within walking distance of each other in the neighbourhood and can be located with a mobile app. Respondent 3 does however, see that the shared cars located at train stations have a high occupation rate.

THE FUNCTION

According to respondent 1 and 4, the influence of attractiveness of a mobility hub on its adoption comes second in comparison to the need for the residents to use the hub. According to respondent 1 the function of the mobility hub in the mobility system matters a great deal, which depends on its location. For example, the function of a mobility hub in a city centre is different from the function of a hub in rural areas, which therefore reflects on the

usage of the shared cars located there (respondent 1). However, he acknowledges that the role of a mobility hub is changing and that in neighbourhoods with few parking places it probably will become the alternative of the second owned car.

THE TARGET GROUP AS KNOWN BY THE EXPERTS FOR WHICH MOBILITY HUBS ARE DEVELOPED

Respondents 4, 5 and 6 do not think there is a specific target group for a mobility hub and provide different reasons for this:

- Respondent 4 describes that mobility hubs are not constructed for certain types of residents but rather for certain types of travellers (e.g. people coming by car from outside the city). In this case the shared car would only be appealing in a corridor hub (i.e. a hub connected to public transport further from the city centre).
- Respondent 5 thinks that there is no target group because a mobility hub should be available and accessible for everyone.
- Respondent 6 states that there is not a specific target group for a mobility hub and that it would be more fruitful to think in moments (i.e. life changes like moving).

THE ROLE OF POSSIBLE NEGATIVE EFFECTS OF A MOBILITY HUB IN THE DESIGN PROCESS ACCORDING TO EXPERTS

The downsides of a mobility hub that should be considered are: social safety, increased walking distances and that it can be hard to make a hub profitable. By some experts additional car trips is seen as a possible risk, but most do not see this as a risk.

SOCIAL SAFETY AND PROFITABILITY

Respondent 1 does mention the social safety in the hours after sunset as a worrisome aspect of the hub and the downside that it can be hard to make a hub profitable.

INCREASED WALKING DISTANCES

The negative effect of a mobility hub, according to 2, is that the shared cars are less spread out through the neighbourhood which would cause for greater walking distances to a shared car. With regard to this, respondent 2 mentions that in this case it would be important to have good parking spots for bicycles.

THE RISK OF ADDITIONAL CAR TRIPS

The chance that mobility hubs with shared cars will increase the car trips is acknowledged to be a risk by respondent 2 and 6. However, respondent 6 makes the remark that the public transport offers additional benefits that make people choose this mode of transport over the use of a car. It also must be noted that it is still a risk only and that respondent 2 does not know whether this negative effect will actually be realised. In addition, respondent 1 mentions that he has never heard of the argument that a mobility hub would cause so much additional car trips (amongst the people that are now public transport users), that this would become a negative effect of the hub. This is supported by respondent 5 who thinks that the percentage of shared cars in the mobility system is at the moment so low that there are no negative effects visible yet.

THE PERSONAL EXPERIENCE OF THE EXPERTS WITH SHARED CARS AND MOBILITY HUBS

The personal experience of the experts with shared cars is mostly limited, the reasons mentioned for this are: family situations, inconvenience, reliability, unawareness and laziness. If an expert used a shared car it was out of necessity.

For example, respondent 1 has not yet been a user of shared cars so far because of its family situation. However, as his family situation has now changed (i.e. his kids grew up) he is planning to switch their second car of the household far a shared car. Another important reason, according to respondent 1, for people to be reluctant to switch to a shared car is the fact that they do not know yet whether they can rely on the availability of the shared car. It is assumed by respondent 1 that the user perceives convenience as an important component whether to choose for a certain mode of transport. In addition, if people are unaware of the location of the shared car in their area and do not know how to use it they are often too lazy to research this and instead will use the transport that they know, which would be their own car 1.

Respondent 2 has considered to use a shared car, but the convenience of her own car outweighed each time the benefit of a shared car. Respondent 2 does however see an electric shared car as a possibility to discover what it is like to drive an electric car.

Respondent 5 is familiar with the use of a shared car and although he thinks that facilities at its location would make the use of the car even more attractive, he states that the main reason for him to use the shared car is out of necessity since the respondent does not own a car.

The benefits of a mobility hub that will make a shared car located there in the future more beneficial than the use of a private car according to experts

Factors that could, according to experts, make it more attractive to offer a shared car at a mobility hub instead of stand-alone are: opportunities of extra profitability and increased attractiveness due to additional facilities or type of cars offered.

Profitability

According to respondent 1, additional facilities are deemed to be important with respect to profitability of the hub. According to respondent 2, adding these facilities (i.e. postal services, coffee corners or small libraries) at a mobility hub are amongst the possibility, however this is seen as of secondary importance and are therefore in most cases not yet been realised.

Additional facilities

As a way to attract people from the neighbourhood to the hub respondent 1 mentions that charging station for electric cars could be used. Respondent 1 further mentions that facilities like “seats to meet”, postal lockers, coffee corner or a dry cleaner could make the mobility hub more attractive for users. This success of these facilities is bound to the location of the hub (respondent 1). However according to him, the most important factor would probably be that is has to be cheaper to use the shared car located there in comparison with a private owned car.

Type of cars offered

Respondents 5 and 6 think that, in case a mobility hub would offer the possibility to make use of different type of cars (e.g. sports car or a van), than it would offer a benefit that ownership of a private car cannot offer. According to respondent 5, this could even be a competitive element between the ownership of a car and the use of a shared car located at a mobility hub.

Reoccurring themes that could influence the choice for a shared car located at a mobility hub scored by the experts on degree of influence

Based on the extensive literature study and a brainstorm session the themes in Table D-1 seem to influence to some degree the traveller’s choice of using a shared car at a mobility hub. The experts were asked to score these themes on a scale from 1 to 5. If they scored a theme at 1 this mend that they did not think this theme would contribute to the likelihood of a traveller to choose for a shared car at a mobility hub. In case they scored a theme at 5 they believed the theme could play a large role for a traveller to choose for a shared car located at a mobility hub.

Theme		# of the respondent (expert)						Average score	
		01	02	03	04	05	06		
A	Attitudes	2,5	3	5	5	5	1	**3,6**	A
B	Functional requirements	4	4	5	5	5	5	**4,7**	B
C	Personal requirements	5	3	4	5	5	5	**4,5**	C
D	Psychological influence	3	2	4,5	4	3	5	**3,6**	D
E	Aspects of the journey	3	4,5	5	4	5	5	**4,4**	E
F	Challenging characteristics of potential users	5	2	3,5	4	5	1	**3,4**	F
G	Facilities	2,5	3,5	-	3	5	3	**3,4**	G
H	Type of the cars offered	5	5	-	3	5	3	**4,2**	H
I	Presence of additions for shared cars	4	3,5	3	3	5	3	**3,6**	I
J	Financial aspects	5	4	5	4	5	5	**4,7**	J
K	Service point	2	2,5	1	3	3	3	**2,4**	K

TABLE D-0-1 INDICATION OF WEIGHTS CONSIDERING A THEME, SCORED PER EXPERT

APPENDIX E: ANSWERS IN EXPERT INTERVIEWS

In this Appendix the highlights from each separate expert interview can be found.

RESPONDENT 1

Organisation: *Ministry of Infrastructure and Water Management (I&W)*
Key-role: *Responsible for subsidies for the development of mobility hubs in The Netherlands*

QUESTION 1: WAT BEÏNVLOED VOLGENS U HET GEBRUIK VAN EEN MOBILITEIT HUB?

Regarding this subject respondent 1 mentions that it is good to realise that in many cases the Dutch government and the involved market parties do not know yet when a mobility hub is marked as successful. According to respondent 1 a mobility hub will only become successful with flanking policies such as parking restrictions or a prohibition of free-floating shared vehicles in the area.

Respondent 1 assumes that it would be more attracting, in comparison to "gas" stations, for potential users to charge their electric vehicle at a mobility hub that contains facilities such as a postal service, a small drugstore, a dry-cleaning service or seats to meet (i.e. work-/ conference room). This would make the hub more attractive for potential users and is a key element for exploiters in case there are no paid parking places at that location (respondent 1).

In another statement respondent 1 mentions that the location of the mobility hub is also important as the usage of its additional services depend on it as well. If the mobility hub is located in a low-income neighbourhood the residents will not be drinking an expensive cup of coffee there (respondent 1).

QUESTION 1A: WAAROM BEÏNVLOED DIT HET GEBRUIK VAN EEN HUB?

(not asked / no answer)

QUESTION 1B: VOOR WIE IS DIT BELANGRIJK?

(not asked / no answer)

QUESTION 2: WAT BEÏNVLOED VOLGENS U HET GEBRUIK VAN EEN DEELAUTO?

(not asked / no answer)

QUESTION 3: WAAR WORDT HET POTENTIËLE GEBRUIK VAN EEN MOBILITEIT HUB OP GEBASEERD?

(not asked / no answer)

QUESTION 4: WELKE ROL SPEELT VOLGENS U DE POTENTIËLE GEBRUIKER IN HET ONTWERP, LOCATIE EN AANBOD VAN EEN MOBILITEIT HUB?

The first remark regarding this question (1) makes is that in most cases the provider plays a big role in the type of shared vehicles that are provided at a mobility hub.

According to (1) when looking at the location of the mobility hub and the preferences of its potential users, the preference of a small walking distance is taken into account the most.

Regarding the design an important factor is the scarcity of space in existing neighbourhoods (1).

Respondent (1) mentions that nowadays during the development of mobility hubs the incomes or social-economical statuses of the residents are not yet taken into account. He says that these are factors that can predict in some extend the usage of a mobility hub and that therefore the role of the potential user might be still insufficient.

Question 4a: De potentiële gebruiker wordt vaak omschreven als de groep waarbij de kans het grootst is dat ze een hub gaan gebruiken, maar hoe zit het met de doelgroep dat nu in een privé auto zit?

According to (1) the group that now drives a private car could potentially choose to switch to the use of a shared car out om environmental concerns, but he doubts that it has much influence. However, he thinks that in case this is of influence for people, a hub would be more attractive if it offers shared cars that are electric. He says that a bigger factor would be that when someone drives less than 10.000 km per year, a shared car would probably be cheaper. However, private car owners do not always take all the expenses of owning a car into mind when considering the switch to a shared car (1).
The travellers want a transportation mode that suits their daily life (1).

Question 4b: Welke bijdrage heeft u zelf geleverd aan het laten aansluiten van het ontwerp, locatie en aanbod van de hub op de potentiële gebruiker?

(not asked / no answer)

Question 5: Welke rol zou de deelauto in een mobiliteit hub kunnen innemen?

(not asked / no answer)

Question 6: Welke rol heeft volgens u de mobiliteit hub in het deelauto gebruik nu?

According to (1) the function of the mobility hub in the mobility system matters, which depends on its location. The function of a mobility hub in a city centre is different from the function of a hub in rural areas, which therefore reflects on the usage of the shared cars located there (1). (1) acknowledges that the role of a mobility hub is changing and that in neighbourhoods with few parking places it will become the alternative of the second owned car.

Question 6a: En welke rol zou dat volgens u in de toekomst kunnen / moeten zijn?

(not asked / no answer)

Question 7: Voor welke doelgroep zouden mobiliteit hubs met deelauto's worden aangelegd?

The primarily reasons to implement mobility hubs and their location are often based on needs in the mobility system (coming from traveller flows and traffic jams) and not on the needs of potential users (1). Only as a secondary step the needs of the potential users will be taken into account (1).

Question 8: Is de doelgroep waarvoor mobiliteit hubs met deelauto's worden aangelegd bij u bekend?

(not asked / no answer)

Question 8a: Zo ja, wat is dit profiel?

(not asked / no answer)

Question 8b: Als de doelgroep afwijkt van de literatuur: waarom is de doelgroep nu niet de mensen die een privé auto gebruiken?

(not asked / no answer)

Question 9: Welke rol spelen eventuele negatieve effecten van de mobiliteit hub in het ontwerp proces?

Respondent (1) mentions that he has never heard of the argument that a mobility hub would cause so much additional car trips (amongst the people that are now public transport users), that this would become a negative effect of the hub. He does mention the social safety in the hours after sunset as a worrisome aspect of the hub and the downside that it can be hard to make a hub profitable.

Question 10: Heeft u zelf wel eens een (wijk)hub gebruikt, en zo ja hoe was de ervaring?

Respondent (1) has not yet been a user of shared cars so far because of its family situation. However, as his family situation has now changed (i.e. his kids grew up) he is planning to switch their second car of the household far a shared car. Another important reason, according to respondent (1), for people to be reluctant to switch to a shared car is the fact that they do not know yet whether they can rely on the availability of the shared car.

It is assumed by respondent (1) that the user perceives convenience as an important component whether to choose for a certain mode of transport. In addition, if people are unaware of the location of the shared car in their area and do not know how to use it they are often too lazy to research this and instead will use the transport that they know, which would be their own car (1).

Question 10a: Weet u of er in de buurt van uw woonlocatie een mobiliteit hub is?

Respondent (1) is aware that there is not a mobility hub in his neighbourhood and does mention the unawareness amongst residents regarding mobility hubs plays a role in the adaption of hubs. Once a resident is aware of a mobility hub in its neighbourhood their attitude becomes an important factor in its adoption (1).

Question 11: Wat zou een hub volgens u moeten bieden zodat een deel auto daar in de toekomst voordeliger is dan een privé auto?

Respondent (1) first noted that it is only after the need of a hub in a certain area is determined that developers will look at what would fit the potential users in that area. Additional facilities are deemed to be important, according to respondent (1), with respect to profitability of the hub. These success of these facilities is bound to the location of the hub (1).

According to respondent (1), besides that there has to be a need (e.g. because of parking restrictions) in the neighbourhood to use the mobility hub, the most important factor would probably be that is has to be cheaper to use the shared car located there in comparison with a private owned car.

As a way to attract people from the neighbourhood to the hub respondent (1) mentions that charging station for electric cars could be used.

Respondent (1) further mentions that facilities like “seats to meet”, postal lockers, coffee corner or a dry cleaner could make the mobility hub more attractive for users.

Question 12: In hoeverre acht u dat het volgende het gebruik van de deelauto op een mobiliteit hub beïnvloed voor de genoemde doelgroep?

Attitudes	**2,5**
Functional requirements	**4**
Personal requirements	**5**
Psychological influence	**3**
Aspects of the journey	**3**
Characteristics of private car owners	**5**
Facilities	**2,5**
Type of the cars offered	**5**
Presence of additions for shared cars	**4**
Financial aspects	**5**
Service point	**2**
Logistics	**4**

RESPONDENT 2

Organisation: *The municipality of Utrecht*
Key-role: *Senior policy advisor regarding shared mobility and project leader in construction projects of mobility hubs*

QUESTION 1: WAT BEÏNVLOED VOLGENS U HET GEBRUIK VAN EEN MOBILITEIT HUB?

According to respondent (2) the offered vehicles at a mobility hub should be in line with the needs and preferences of its potential user, which are different in certain areas.

A uniform style is developed to increase the recognisability of mobility hubs, respondent 2 thinks this will make a hub more attractive. However, whether this effect actually does occur still has to be researched.

The walking distance to a mobility hub is seen by respondent 2 as an important factor regarding whether residents will make use of it. The type of vehicle offered at a mobility hub determines to some extent the willingness of the potential user to walk a certain distance (2). According to 2, people are more willing to walk a larger distance to a shared car than they are to a shared bicycle.

QUESTION 1A: WAAROM BEÏNVLOED DIT HET GEBRUIK VAN EEN HUB?

(not asked / no answer)

QUESTION 1B: VOOR WIE IS DIT BELANGRIJK?

(not asked / no answer)

QUESTION 2: WAT BEÏNVLOED VOLGENS U HET GEBRUIK VAN EEN DEELAUTO?

On the subject of electric cars, it seems to respondent 2 that shared electric cars are nowadays more of a barrier instead of making car sharing more attractive.

QUESTION 3: WAAR WORDT HET POTENTIËLE GEBRUIK VAN EEN MOBILITEIT HUB OP GEBASEERD?

(not asked / no answer)

QUESTION 4: WELKE ROL SPEELT VOLGENS U DE POTENTIËLE GEBRUIKER IN HET ONTWERP, LOCATIE EN AANBOD VAN EEN MOBILITEIT HUB?

Respondent 2 mentions that for the larger hubs the potential user plays a role in the design, location and offered vehicles at the hub. However according to respondent 2, the potential user does not play a role in this regarding smaller hubs, as these are mainly determined by the available space.

QUESTION 4A: DE POTENTIËLE GEBRUIKER WORDT VAAK OMSCHREVEN ALS DE GROEP WAARBIJ DE KANS HET GROOTST IS DAT ZE EEN HUB GAAN GEBRUIKEN, MAAR HOE ZIT HET MET DE DOELGROEP DAT NU IN EEN PRIVÉ AUTO ZIT?

Respondent (2) describes the predicted user between 25 and 40 years old with a with a conscious mindset regarding their mobility choice, but does mention that their ultimate goal with implementing shared mobility is to reduce car ownership.

According to respondent 2, the users of shared mobility are most likely people between the age of 25 and 40 and conscious about their mode of transport. Although it is recognised by (2) that this group has the highest chance of adopting shared cars, their goal is to reduce car ownership.

QUESTION 4B: WELKE BIJDRAGE HEEFT U ZELF GELEVERD AAN HET LATEN AANSLUITEN VAN HET ONTWERP, LOCATIE EN AANBOD VAN DE HUB OP DE POTENTIËLE GEBRUIKER?

(not asked / no answer)

QUESTION 5: WELKE ROL ZOU DE DEELAUTO IN EEN MOBILITEIT HUB KUNNEN INNEMEN?

(not asked / no answer)

Question 6: Welke rol heeft volgens u de mobiliteit hub in het deelauto gebruik nu?

Respondent 2 does not see the mobility hub as a way to increase the attractiveness of shared cars located there and mentions that this potential effect would be more interesting for the providers of the shared cars.

Respondent 2 does recognise that a mobility hub could provide additional opportunities (e.g. the service of distributing car seats) to make it more attractive to use a shared car located there. The attractiveness of a hub might be increased if charging stations are present for private and shared cars, says (2).

Question 6a: En welke rol zou dat volgens u in de toekomst kunnen / moeten zijn?

(not asked / no answer)

Question 7: Voor welke doelgroep zouden mobiliteit hubs met deelauto's worden aangelegd?

(not asked / no answer)

Question 8: Is de doelgroep waarvoor mobiliteit hubs met deelauto's worden aangelegd bij u bekend?

(not asked / no answer)

Question 8a: Zo ja, wat is dit profiel?

(not asked / no answer)

Question 8b: Als de doelgroep afwijkt van de literatuur: waarom is de doelgroep nu niet de mensen die een privé auto gebruiken?

(not asked / no answer)

Question 9: Welke rol spelen eventuele negatieve effecten van de mobiliteit hub in het ontwerp proces?

The chance that mobility hubs with shared cars will increase the car trips is acknowledged to be a risk by respondent 2. It has to be said that it is still a risk only and that respondent 2 does not know whether this negative effect will actually be realised.

The negative effect of a mobility hub, according to 2, is that the shared cars are less spread out through the neighbourhood which would cause for greater walking distances to a shared car. With regard to this, respondent 2 mentions that in this case it would be important to have good parking spots for bicycles.

Question 10: Heeft u zelf wel eens een (wijk)hub gebruikt, en zo ja hoe was de ervaring?

Respondent 2 has considered to use a shared car, but the convenience of her own car outweighed each time the benefit of a shared car. Respondent 2 does however see an electric shared car as a possibility to discover what it is like to drive an electric car.

Question 11: Wat zou een hub volgens u moeten bieden zodat een deelauto daar in de toekomst voordeliger is dan een privé auto?

According to respondent 2, adding facilities (i.e. postal services, coffee corners or small libraries) at a mobility hub are amongst the possibility, however this is seen as of secondary importance and are therefore in most cases not yet been realised.

Question 12: In hoeverre acht u dat het volgende het gebruik van de deelauto op een mobiliteit hub beïnvloed voor de genoemde doelgroep?

Attitudes	**3**
Functional requirements	**4**
Personal requirements	**3**
Psychological influence	**2**
Aspects of the journey	**4,5**
Characteristics of private car owners	**2**
Facilities	**3,5**
Type of the cars offered	**5**
Presence of additions for shared cars	**3,5**
Financial aspects	**4**
Service point	**2,5**
Logistics	**3,5**

RESPONDENT 3

Organisation: Shared car provider
Key-role:Coordinator of policies with politicians and official on the subject of shared cars

QUESTION 1: WAT BEÏNVLOED VOLGENS U HET GEBRUIK VAN EEN MOBILITEIT HUB?

(not asked / no answer)

QUESTION 1A: WAAROM BEÏNVLOED DIT HET GEBRUIK VAN EEN HUB?

(not asked / no answer)

QUESTION 1B: VOOR WIE IS DIT BELANGRIJK

(not asked / no answer)

QUESTION 2: WAT BEÏNVLOED VOLGENS U HET GEBRUIK VAN EEN DEELAUTO?

Respondent 3 thinks that providing information regarding the location and availability of shared cars has a large influence on the adoption of shared cars and in lesser degree providing information regarding (future) parking restrictions. In addition, convenience is mentioned as influencing factor, which would according to respondent 3 be based on the walking distance to the shared car and its 24 hour accessibility.

Respondent (3) states that it is important for the shared cars to be accessible at all times, moreover there should be no barriers (Dutch slagbomen) and no doors to go through before reaching the shared car, because some should be able to get in and go, just like when they would use a private car.

Another factor of influence is the visibility of the shared car, it is stated by (3) that this is an important factor regarding the adoption of the shared car by residents. This visibility would be less in case (existing) parking garages are transformed to mobility hubs.

The occasion (e.g. shopping at IKEA) sometimes determines the need for a shared car in case people do not own a car (3).

According to (3), instead of being attractive for its sustainability, electric shared cars can be more of a barrier for potential users.

QUESTION 3: WAAR WORDT HET POTENTIËLE GEBRUIK VAN EEN MOBILITEIT HUB OP GEBASEERD?

(not asked / no answer)

QUESTION 4: WELKE ROL SPEELT VOLGENS U DE POTENTIËLE GEBRUIKER IN HET ONTWERP, LOCATIE EN AANBOD VAN EEN MOBILITEIT HUB?

Respondent (3) mentions that it is good to have a diversity of offered cars so it connects to the different preferences of their users. However, the diversity should not be too broad as people want to know what to expect (3).

QUESTION 4A: DE POTENTIËLE GEBRUIKER WORDT VAAK OMSCHREVEN ALS DE GROEP WAARBIJ DE KANS HET GROOTST IS DAT ZE EEN HUB GAAN GEBRUIKEN, MAAR HOE ZIT HET MET DE DOELGROEP DAT NU IN EEN PRIVÉ AUTO ZIT?

(not asked / no answerd)

QUESTION 4B: WELKE BIJDRAGE HEEFT U ZELF GELEVERD AAN HET LATEN AANSLUITEN VAN HET ONTWERP, LOCATIE EN AANBOD VAN DE HUB OP DE POTENTIËLE GEBRUIKER?

(not asked / no answer)

QUESTION 5: WELKE ROL ZOU DE DEELAUTO IN EEN MOBILITEIT HUB KUNNEN INNEMEN?

The shared car could play a role in a mobility hub, but only if it is 24 hours accessible at that hub (3). In additions, respondent 3 (shared car provider) mentions that it would be realistic if 2 or 3 cars would be stored at a neighbourhood mobility hub and that 10 cars at once would probably not be doable for them given the investment costs. Moreover, based on the experience of her organisation those cars would not be used.

It is important to offer a diversity of shared cars, that is why the organisation of respondent 3 offers larger and smaller types.

Question 6: Welke rol heeft volgens u de mobiliteit hub in het deelauto gebruik nu?

Respondent (3) does not yet recognise that a neighbourhood mobility hub would have additional benefits regarding the attractiveness to use a shared car located there. The main reasons for this, given by respondent 3, are that the walking distance to a mobility hub could be larger in comparison to an individual parked shared car and that the shared car could become less visible. Respondent 3 does however, see that the shared cars located at train stations have a high occupation rate.

With the current strategy of (3) they do not need a mobility hub.

The availability and workability of loading infrastructure is currently a problem regarding the implementation of electric shared cars (3). In case a mobility hub could make it possible to provide good and reliable charging stations, than it could be interesting for (3) to park their shared cars there.

Question 6a: En welke rol zou dat volgens u in de toekomst kunnen / moeten zijn?

(not asked / no answer)

Question 7: Voor welke doelgroep zouden mobiliteit hubs met deelauto's worden aangelegd?

(not asked / no answer)

Question 8: Is de doelgroep waarvoor mobiliteit hubs met deelauto's worden aangelegd bij u bekend?

(not asked / no answer)

Question 8a: Zo ja, wat is dit profiel?

(not asked / no answer)

Question 8b: Als de doelgroep afwijkt van de literatuur: waarom is de doelgroep nu niet de mensen die een privé auto gebruiken?

(not asked / no answer)

Question 9: Welke rol spelen eventuele negatieve effecten van de mobiliteit hub in het ontwerp proces?

(not asked / no answer)

Question 10: Heeft u zelf wel eens een (wijk)hub gebruikt, en zo ja hoe was de ervaring?

(not asked / no answer)

Question 11: Wat zou een hub volgens u moeten bieden zodat een deel auto daar in de toekomst voordeliger is dan een privé auto?

(not asked / no answer)

Question 12: In hoeverre acht u dat het volgende het gebruik van de deelauto op een mobiliteit hub beïnvloed voor de genoemde doelgroep?

Attitudes	**5**
Functional requirements	**5**
Personal requirements	**4**
Psychological influence	**4,5**
Aspects of the journey	**5**
Characteristics of private car owners	**3,5**
Facilities	**-**
Type of the cars offered	**-**
Presence of additions for shared cars	**3**
Financial aspects	**5**
Service point	**1**
Logistics	**5**

RESPONDENT 4

Organisation: Ministry of Infrastructure and Water Management (I&W)
Key-role:Advisor on the subject of shared mobility at the Ministry of Infrastructure and Water Management

QUESTION 1: WAT BEÏNVLOED VOLGENS U HET GEBRUIK VAN EEN MOBILITEIT HUB?

Respondent 4 mentions that the use of a mobility hub is connected to the degree in which residents are used to not use their own car.

According to 4, the adoption of a mobility hub in a neighbourhood depends on flanking policies (e.g. parking restrictions), as she mentions that people will only start to use the mobility hub if they have a reason to do so.

With regard to the possibility of adding facilities to a mobility hub, respondent 4 could imagine that this would attract residents to the hub in case these facilities are not already available in the neighbourhood. However, 4 mentions that in this case the residents would come to the mobility hub because of the facilities and not to travel with the shared car located there. This could however, according to 4, increase the chance of the residents using the shared car located at the mobility hub as this increases the visibility of the car as the residents are at the hub.

Respondent 4 states that the walking distance is one of the most important aspects for residents whether to use the shared car located at a mobility hub. Respondent 4 suggests that, if a shared car is located at a closer distance in comparison to a shared car located at a hub, the walking distance remains the most important factor and not the possible additional benefits (e.g. facilities and services) at the mobility hub.

Respondent 4, thinks that adding charging stations to a mobility hub could attract residents to come to the hub in case they experience difficulties with getting these stations in their own street.

QUESTION 1A: WAAROM BEÏNVLOED DIT HET GEBRUIK VAN EEN HUB?

(not asked / no answer)

QUESTION 1B: VOOR WIE IS DIT BELANGRIJK?

(not asked / no answer)

QUESTION 2: WAT BEÏNVLOED VOLGENS U HET GEBRUIK VAN EEN DEELAUTO?

According to respondent 4, getting people to at least try a shared car is an important first step in its adoption. This could be at moments that a potential user is in between cars (e.g. their private car is being repaired).

The awareness amongst residents regarding the option of shared cars in their neighbourhood remains an important factor in the adoption of shared cars, according to respondent 4.

Respondent 4 could imagine that, if there are reasons for residents to be a mobility hub, besides the vehicles, it could help with the awareness regarding the possibilities of shared vehicles that are located there.

According to respondent 4, the users of private cars are often unaware of its accompanying total costs and therefore in some cases ignorant of the financial benefits a shared car could provide.

The travel distance does influence the use of a shared car according to respondent 4, as she mentions that for short distances private vehicles are preferred as in comparison to larger distances a shared car would cost a lot.

QUESTION 3: WAAR WORDT HET POTENTIËLE GEBRUIK VAN EEN MOBILITEIT HUB OP GEBASEERD?

(not asked / no answer)

QUESTION 4: WELKE ROL SPEELT VOLGENS U DE POTENTIËLE GEBRUIKER IN HET ONTWERP, LOCATIE EN AANBOD VAN EEN MOBILITEIT HUB?

Respondent 4 thinks that, the role of the potential user of a mobility hub in its design and offered vehicles depends on the kind of hub and its location. The needs and preferences of a potential user, according to R04, are not always taken into account regarding the hubs design or offered vehicles and its location is mostly determined by the availability of space.

Question 4a: De potentiële gebruiker wordt vaak omschreven als de groep waarbij de kans het grootst is dat ze een hub gaan gebruiken, maar hoe zit het met de doelgroep dat nu in een privé auto zit?
(not asked / no answer)

Question 4b: Welke bijdrage heeft u zelf geleverd aan het laten aansluiten van het ontwerp, locatie en aanbod van de hub op de potentiële gebruiker?
(not asked / no answer)

Question 5: Welke rol zou de deelauto in een mobiliteit hub kunnen innemen?
(not asked / no answer)

Question 6: Welke rol heeft volgens u de mobiliteit hub in het deelauto gebruik nu?
The influence of attractiveness of a mobility hub on its adoption comes second, according to 4, in comparison to the need for the residents to use the hub.

The possibility of offering a diversity of shared vehicles at a mobility hub is not seen by respondent for as a benefit in case the vehicles are within walking distance of each other in the neighbourhood and can be located with a mobile app.

According to respondent 4, a mobility hub could create extra visibility of shared cars, but this would only be beneficial to attract users for the first time.

According to respondent 4, the mobility hub provides a possibility to add services (e.g. a locker for a child seat) in comparison to the possibilities of a individually parked shared car.

Question 6a: En welke rol zou dat volgens u in de toekomst kunnen / moeten zijn?
(not asked / no answer)

Question 7: Voor welke doelgroep zouden mobiliteit hubs met deelauto's worden aangelegd?
Respondent 4 describes that mobility hubs are not constructed for certain types of residents but rather for certain types of travellers (e.g. people coming by car from outside the city). In this case the shared car would only be appealing in a corridor hub (i.e. a hub connected to public transport further from the city centre).

Question 8: Is de doelgroep waarvoor mobiliteit hubs met deelauto's worden aangelegd bij u bekend?
(not asked / no answer)

Question 8a: Zo ja, wat is dit profiel?
(not asked / no answer)

Question 8b: Als de doelgroep afwijkt van de literatuur: waarom is de doelgroep nu niet de mensen die een privé auto gebruiken?
(not asked / no answer)

Question 9: Welke rol spelen eventuele negatieve effecten van de mobiliteit hub in het ontwerp proces?

According to respondent 4, increasing the attractiveness and therefore the usage of shared cars would have a net positive effect, as this would decrease car ownership.

Question 10: Heeft u zelf wel eens een (wijk)hub gebruikt, en zo ja hoe was de ervaring?

(not asked / no answer)

Question 11: Wat zou een hub volgens u moeten bieden zodat een deel auto daar in de toekomst voordeliger is dan een privé auto?

(not asked / no answer)

Question 12: In hoeverre acht u dat het volgende het gebruik van de deelauto op een mobiliteit hub beïnvloed voor de genoemde doelgroep?

Attitudes	**5**
Functional requirements	**5**
Personal requirements	**5**
Psychological influence	**4**
Aspects of the journey	**4**
Characteristics of private car owners	**4**
Facilities	**3**
Type of the cars offered	**3**
Presence of additions for shared cars	**3**
Financial aspects	**4**
Service point	**3**
Logistics	**5**

RESPONDENT 5

Organisation: *Ministry of Infrastructure and Water Management (I&W)*
Key-role: *Member of the department roads and travel safety and actively involved in the development of MAAS*

QUESTION 1: WAT BEÏNVLOED VOLGENS U HET GEBRUIK VAN EEN MOBILITEIT HUB?

Respondent 5 makes the remark that besides physical visibility, it is important that a mobility hub is digitally visible (e.g. is shown on a MaaS-app). In addition, respondent 5 stipulates the importance of flanking policies like parking restrictions regarding the adoption of mobility hubs.

QUESTION 1A: WAAROM BEÏNVLOED DIT HET GEBRUIK VAN EEN HUB?

(not asked / no answer)

QUESTION 1B: VOOR WIE IS DIT BELANGRIJK

(not asked / no answer)

QUESTION 2: WAT BEÏNVLOED VOLGENS U HET GEBRUIK VAN EEN DEELAUTO?

According to respondent 5, financial aspects play a role in the adoption of shared cars, and a notion is made that private car owners are often unaware of the total costs of ownership and therefore might be ignorant of the financial benefits a shared car could provide. In addition, the same influence of parking restrictions as for the adoption of mobility hubs is mentioned by respondent 5.

Respondent 5 mentions that the quality (e.g. the latest model) of a shared car in comparison with the ownership of a car could be attractive for potential users. However, according to him this is of secondary importance as the main reason to use a shared car remains that there is a certain need (e.g. due to parking restrictions).

QUESTION 3: WAAR WORDT HET POTENTIËLE GEBRUIK VAN EEN MOBILITEIT HUB OP GEBASEERD?

(not asked / no answer)

QUESTION 4: WELKE ROL SPEELT VOLGENS U DE POTENTIËLE GEBRUIKER IN HET ONTWERP, LOCATIE EN AANBOD VAN EEN MOBILITEIT HUB?

(not asked / no answer)

QUESTION 4A: DE POTENTIËLE GEBRUIKER WORDT VAAK OMSCHREVEN ALS DE GROEP WAARBIJ DE KANS HET GROOTST IS DAT ZE EEN HUB GAAN GEBRUIKEN, MAAR HOE ZIT HET MET DE DOELGROEP DAT NU IN EEN PRIVÉ AUTO ZIT?

(not asked / no answer)

QUESTION 4B: WELKE BIJDRAGE HEEFT U ZELF GELEVERD AAN HET LATEN AANSLUITEN VAN HET ONTWERP, LOCATIE EN AANBOD VAN DE HUB OP DE POTENTIËLE GEBRUIKER?

(not asked / no answer)

QUESTION 5: WELKE ROL ZOU DE DEELAUTO IN EEN MOBILITEIT HUB KUNNEN INNEMEN?

Respondent 5 believes that mobility hubs are being located at places where travellers are likely to come together and that in that case adding a shared car to the hub would provide a benefit for its users.

QUESTION 6: WELKE ROL HEEFT VOLGENS U DE MOBILITEIT HUB IN HET DEELAUTO GEBRUIK NU?

The role of a mobility hub in the use of a shared car located there depends, according to 5, partly on the way a hub is designed. Respondent 5 notes that in case additional facilities are added to the hub (e.g. a postal service) it could offer benefits (e.g. the concentration of facilities) which would make it more attractive for users to make use of the mobility hub. Respondent 5 believes that if a hub is more attractive that it would increase the usage of shared cars located there.

Question 6a: En welke rol zou dat volgens u in de toekomst kunnen / moeten zijn?

(not asked / no answer)

Question 7: Voor welke doelgroep zouden mobiliteit hubs met deelauto's worden aangelegd?

(not asked / no answer)

Question 8: Is de doelgroep waarvoor mobiliteit hubs met deelauto's worden aangelegd bij u bekend?

Respondent 5 thinks that there is no target group because a mobility hub should be available and accessible for everyone.

Question 8a: Zo ja, wat is dit profiel?

(not asked / no answer)

Question 8b: Als de doelgroep afwijkt van de literatuur: waarom is de doelgroep nu niet de mensen die een privé auto gebruiken?

(not asked / no answer)

Question 9: Welke rol spelen eventuele negatieve effecten van de mobiliteit hub in het ontwerp proces?

Respondent 5 thinks that the percentage of shared cars in the mobility system is at the moment so low that there are no negative effects visible yet.

Question 10: Heeft u zelf wel eens een (wijk)hub gebruikt, en zo ja hoe was de ervaring?

Respondent 5 is familiar with the use of a shared car and although he thinks that facilities at its location would make the use of the car even more attractive, he states that the main reason for him to use the shared car is out of necessity since the respondent does not own a car.

Question 11: Wat zou een hub volgens u moeten bieden zodat een deelauto daar in de toekomst voordeliger is dan een privé auto?

Respondent 5 thinks that, in case a mobility hub would offer the possibility to make use of different type of cars (e.g. sports car or a van), than it would offer a benefit that ownership of a private car cannot offer. According to respondent 5, this could even be a competitive element between the ownership of a car and the use of a shared car located at a mobility hub.

Question 12: In hoeverre acht u dat het volgende het gebruik van de deelauto op een mobiliteit hub beïnvloed voor de genoemde doelgroep?

Attitudes	**5**
Functional requirements	**5**
Personal requirements	**5**
Psychological influence	**3**
Aspects of the journey	**5**
Characteristics of private car owners	**5**
Facilities	**5**
Type of the cars offered	**5**
Presence of additions for shared cars	**5**
Financial aspects	**5**
Service point	**3**
Logistics	**3**

RESPONDENT 6

Organisation: Arriva / Glimble
Key-role:Responsible for the program of developing and experimenting with mobility hubs

QUESTION 1: WAT BEÏNVLOED VOLGENS U HET GEBRUIK VAN EEN MOBILITEIT HUB?

Respondent 6 mentions the hypothesis that potential users of a mobility hub would prefer not to transfer between modes of transport. Given that the private car is a convenient way for such a unimodal journey, according to 6, the use of a mobility hub depends on making this journey less convenient. An example mentioned for this is to restrict the parking spaces for private cars. In addition, these people would probably prefer to switch with a great ease between transport modes once at a mobility hub (e.g. from bus to shared car).

Respondent 6 mentions that a mobility hub which offers facilities that make it a nice place to frequently reside could attract potential users as this would increase the visibility of the shared cars located there.
As additional benefit to a mobility hub (e.g. regarding the business case or the travel occasion), according to respondent 6, the hub could offer room for rental cars as well instead of offering only shared cars.

Respondent 6 mentions that first there has to be a reason to use a mobility hub (i.e. the minimal conditions) and secondary the stacking of functions will become important.

Small behavioural interventions at moments that people are sensitive for change (e.g. a new home) could steer people to use a mobility hub, according to respondent 6.

QUESTION 1A: WAAROM BEÏNVLOED DIT HET GEBRUIK VAN EEN HUB?

(not asked / no answer)

QUESTION 1B: VOOR WIE IS DIT BELANGRIJK?

(not asked / no answer)

QUESTION 2: WAT BEÏNVLOED VOLGENS U HET GEBRUIK VAN EEN DEELAUTO?

According to respondent 6 it should replicate the freedom as a private car offers, which is that it is always available and at walking distance from their house.

Respondent 6 mentions that the potential users who are currently using their private car value the personal space of it and the status it gives them.

According to respondent 6, the benefit of a shared car in a street is its visibility.

Respondent 6 thinks that the awareness of the cost benefits amongst potential users could play a role in making the use of a shared car more attractive. He mentions that a mobility hub could offer a place (e.g. a sign) to make people aware of these benefits.

Respondent 6, thinks that the occasion of the trip (e.g. groceries) also matters in the use of a shared car.

QUESTION 3: WAAR WORDT HET POTENTIËLE GEBRUIK VAN EEN MOBILITEIT HUB OP GEBASEERD?

This is not known by respondent 6, but he mentions that for the sustainability of a mobility hub it could be beneficial to leave room for up- or downscaling of the hub.

QUESTION 4: WELKE ROL SPEELT VOLGENS U DE POTENTIËLE GEBRUIKER IN HET ONTWERP, LOCATIE EN AANBOD VAN EEN MOBILITEIT HUB?

It might be beneficial for the ease of use to separate “fast” and “slow” traffic flows at the mobility hub, according to respondent 6.

QUESTION 4A: DE POTENTIËLE GEBRUIKER WORDT VAAK OMSCHREVEN ALS DE GROEP WAARBIJ DE KANS HET GROOTST IS DAT ZE EEN HUB GAAN GEBRUIKEN, MAAR HOE ZIT HET MET DE DOELGROEP DAT NU IN EEN PRIVÉ AUTO ZIT?

(not asked / no answer)

Question 4b: Welke bijdrage heeft u zelf geleverd aan het laten aansluiten van het ontwerp, locatie en aanbod van de hub op de potentiële gebruiker?

(not asked / no answer)

Question 6: Welke rol heeft volgens u de mobiliteit hub in het deelauto gebruik nu?

(not asked / no answer)

Question 6a: En welke rol zou dat volgens u in de toekomst kunnen / moeten zijn?

(not asked / no answer)

Question 8: Is de doelgroep waarvoor mobiliteit hubs met deelauto's worden aangelegd bij u bekend?

Respondent 6 states that there is not a specific target group for a mobility hub and that it would be more fruitful to think in moments (i.e. life changes like moving).

Question 8a: Zo ja, wat is dit profiel?

(not asked / no answer)

Question 8b: Als de doelgroep afwijkt van de literatuur: waarom is de doelgroep nu niet de mensen die een privé auto gebruiken?

(not asked / no answer)

Question 9: Welke rol spelen eventuele negatieve effecten van de mobiliteit hub in het ontwerp proces?

Respondent 6 that these negative effects are considered a risk, but makes the remark that the public transport offer additional benefits that make people choose this mode of transport over the use of a car.

Question 10: Heeft u zelf wel eens een (wijk)hub gebruikt, en zo ja hoe was de ervaring?

(not asked / no answer)

Question 11: Wat zou een hub volgens u moeten bieden zodat een deelauto daar in de toekomst voordeliger is dan een privé auto?

Respondent 6 thinks that offering a diversity in types of shared cars (e.g. cabrio or a van) could offer a benefit that makes it more enjoyable to go to a mobility hub instead of using a private car.

Question 12: In hoeverre acht u dat het volgende het gebruik van de deelauto op een mobiliteit hub beïnvloed voor de genoemde doelgroep?

Attitudes	**1**
Functional requirements	**5**
Personal requirements	**5**
Psychological influence	**5**
Aspects of the journey	**5**
Characteristics of private car owners	**1**
Facilities	**3**
Type of the cars offered	**3**
Presence of additions for shared cars	**3**
Financial aspects	**5**
Service point	**3**
Logistics	**5**

APPENDIX F: INTERVIEW GUIDE FOR RESIDENT INTERVIEWS

In this appendix the list of questions is displayed as it was offered to the residents for the case study.

TU Delft Master Thesis

Default Question Block

Beste deelnemer,

Mijn naam is Jim Hoogenboom, op dit moment schrijf ik een master scriptie vanuit de TU Delft met als doel inzicht krijgen in de rol van mobiliteitshubs in deelautogebruik (mochten deze termen u niet bekend zijn, ze zullen hierna worden uitgelegd). Alvorens bedankt voor uw deelname aan mijn onderzoek. Uw perspectief is waardevol voor mijn onderzoek en daarom zou ik u graag wat vragen stellen. De enquête duurt ongeveer 5 minuten, waarna u kans maakt op een waardebon t.w.v. €10,- (te besteden bij bol.com).

Disclaimer:
Dit is een anonieme enquête georganiseerd door de TU Delft in samenwerking met AT Osborne. Deelname aan de enquête is volledig vrijwillig. Dat de enquête anoniem is houdt in dat al uw persoonlijke data (e.g. uw naam) wordt geanonimiseerd. Deze geanonimiseerde data zal uitsluitend gebruikt worden voor mijn masterscriptie. Deze masterscriptie zal uiteindelijk ook publiekelijk gepubliceerd worden. Onder de deelnemers zullen tien waardebonnen worden verloot (maximaal één per deelnemer). U kunt aangeven hier niet voor in aanmerking te willen komen door het vakje aan het eind van de enquête aan te vinken. Uw antwoord op deze enquête beïnvloedt op geen enkele manier uw win kans op deze waardebon.

Betrokken partijen:
TU Delft & AT Osborne

- ○ Ik ga akkoord met het bovenstaande en start de enquête

Ik zou u graag vrijblijvend willen vragen of u uw postcode wilt invullen. Wilt u dit niet dan vult u niks in.

Ik val binnen de leeftijdsgroep:

- ○ 18-35
- ○ 36-50
- ○ 51-65
- ○ > 65

De mobiliteitshub op onderstaande afbeelding bevind zich binnen 350m van uw woonlocatie. Bent u bekend met het concept "mobiliteitshub" zoals hier weergegeven?

- ○ Nee

- ○ Ik ben bekend met het concept "mobiliteitshub" maar herken deze locatie op de foto niet als hub
- ○ Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is
- ○ Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub
- ○ Ik ben niet bekend met deze locatie maar wel met het concept "mobiliteitshub"
- ○ [ ] Anders, namelijk:

Op een mobiliteitshub worden verschillende vormen van deelvervoer (zoals deelauto's en deelfietsen) aangeboden op één plek.

Er bevind zich een mobiliteitshub binnen 350m van uw woning dat het volgende deelvervoer aanbied:
- 4 deelauto's
- 1 deelbakfiets
- 2 deelfietsen

○ Door naar de volgende vraag

Ik ben bekend met het concept "deelauto" zoals hier weergegeven

○ Ja

○ Nee

Een deelauto stelt mensen in staat om lokaal aangeboden auto's te huren op elk gewenst moment en voor elke tijdsduur. Na gebruik moet de deelauto weer op de mobiliteitshub worden geparkeerd.

- ○ Door naar de volgende vraag

Bent u in het bezit van een rijbewijs?

- ○ Ja
- ○ Nee

Heeft u of uw huishouden een eigen auto (privé bezit of lease) en gebruikt u deze ook? (meerijden valt ook onder het gebruik van de auto)

- ○ Ja, een enkele auto
- ○ Ja, twee auto's
- ○ Ja, drie auto's of meer
- ○ Ja, maar hier maak ik zelf geen gebruik van
- ○ Nee, omdat: [ ]

Wat vindt u van de volgende stelling? "Ik vind over het algemeen dat deelvervoer (auto, fietsen, scooters) een fijne manier van reizen biedt"

- ○ Totaal mee oneens, omdat: [ ]
- ○ Mee oneens, omdat: [ ]

- ○ Neutraal, omdat:
- ○ Mee eens, omdat:
- ○ Totaal mee eens, omdat:
- ○ Geen mening, omdat:

Wist u voordat u aan deze enquête begon dat er een mobiliteitshub bij u in de buurt zit?

- ○ Ja, omdat:
- ○ Ja, maar ik wist niet dat hier ook deelauto's worden aangeboden
- ○ Ja, maar ik wist niet dat dit een mobiliteitshub heet
- ○ Nee, omdat:
- ○ Anders, namelijk:

Heeft u wel eens gebruik gemaakt van deze hub? (meerdere antwoorden zijn mogelijk)

- ☐ Ja een deelauto, omdat:
- ☐ Ja een deelbakfiets, omdat:
- ☐ Ja een deelfiets, omdat:

- [ ] Nee ik heb deze hub nog nooit gebruikt, omdat:
- [ ] Anders, namelijk:

Ik gebruik de deelauto's op deze hub:

- ○ Een enkele keer, omdat:
- ○ Weinig / Sporadisch, omdat:
- ○ Regelmatig / Frequent, omdat:
- ○ Bijna altijd, omdat:

Waarom maakt u gebruik van de deelauto's op deze de hub? (meerdere antwoorden zijn mogelijk)

- [ ] Ik heb geen eigen auto
- [ ] Het is makkelijker omdat je in mijn straat geen plek hebt om te parkeren
- [ ] Omdat ik het fijn vind dat ik de keuze heb uit verschillende type auto's op deze hub
- [ ] Ik zeker weet dat er op deze hub op elk moment van de dag een deelauto beschikbaar is
- [ ] Ik weet dat het gebruik van een deelauto goedkoper voor mij goedkoper is dan het hebben van een privé of lease auto
- [ ] Geen van deze opties
- [ ] Anders, namelijk:

Ik maak geen gebruik van de deelauto's op deze hub omdat: (meerdere antwoorden zijn mogelijk)

- [ ] Ik vind dat de deelauto te duur is
- [ ] Ik niet weet hoe duur het gebruik van een deelauto is t.o.v. een privé of lease auto
- [ ] Ik mij er onveilig voel (in de avond)
- [ ] Ik mij comfortabel voel bij mijn routine
- [ ] Het boeken te moeilijk is en/of te lang duurt
- [ ] Ik mijn eigen auto gewoon voor de deur kan parkeren en de deelauto niet
- [ ] Het type auto dat daar staat niet aansluit op mijn levensstijl
- [ ] Het gebruik van de deelauto op de hub geen extra gemak bied
- [ ] De loopafstand te groot is
- [ ] Er niemand aanwezig is waar ik eventuele vragen aan kan stellen
- [ ] Omdat er geen mogelijkheid is tot extra's zoals kinderzitjes of fietsendragers
- [ ] Ik er niet op kan vertrouwen dat er op elk moment van de dag een deelauto beschikbaar is
- [ ] Ik veel waarde hecht aan mijn eigen ruimte en een deelauto niet netjes wordt achtergelaten
- [ ] Ik niet kan rekenen op de beschikbaarheid van de deelauto
- [ ] Ik een gezin met kinderen heb en dat daardoor niet te doen is
- [ ] Ik geen verre afstanden hoef te reizen
- [ ] Geen van deze opties
- [ ] Anders, namelijk: _____

Zou u overwegen om de deelauto's op deze hub (vaker) te gebruiken als...
(meerdere antwoorden zijn mogelijk)

- [ ] Het boeken van een deelauto wat gemakkelijker zou zijn
- [ ] Ik mijn privé auto niet meer in mijn eigen straat zou mogen parkeren
- [ ] Het mij geen extra tijd zou kosten
- [ ] Ik de keuze zou hebben uit een ander type auto (bijvoorbeeld een groter model voor een rit naar de bouwmarkt)
- [ ] De hub naast deelvervoer ook het gemak zou aanbieden van verschillende faciliteiten zoals een pakketpunt of kiosk
- [ ] De loopafstand naar de hub kleiner zou zijn
- [ ] Er iemand op de hub iemand aanwezig zou zijn om een oogje in het zeil te houden en waar ik vragen aan kan stellen
- [ ] Er op de hub een uitgiftepunt is voor toebehoren zoals kinderstoeltjes of fietsendragers
- [ ] Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is
- [ ] De deelauto net zo netjes wordt achtergelaten als ik dat bij mijn eigen auto zou doen
- [ ] Geen van deze opties
- [ ] Anders, namelijk:

Hier kunt u nog eventuele opmerkingen kwijt, over bijvoorbeeld:
(1) waarom u op dit moment de deelauto's op deze mobiliteitshub wel of niet gebruikt;
(2) wat de mobiliteitshub volgens u zou kunnen bieden dat u dit in de toekomst wel / vaker zou overwegen.

Bedankt voor uw deelname aan mijn onderzoek. Onder de deelnemers verloot ik één bol.com bon t.w.v. €10. Mocht u hier niet voor in aanmerking willen komen kunt u dat hieronder aangeven.

- ○ Ik wil niet meegenomen worden in de loting van de waardebon
- ○ Ik kom graag in aanmerking voor de waardebon en kan naar het volgende mailadres worden gestuurd:

APPENDIX G: OUTCOME RESIDENT INTERVIEWS

In this Appendix all the answers (online and in person) can be found in the Table that has been provided separate from this document in an Excel sheet.

Afstand vanaf de hub	Start vraag	Mobiliteitshub	Mobiliteitshub 7 TEXT	Deelauto	Vraag 2	Vraag 2 5 TEXT	Vraag 3	Vraag 3 1 TEXT	Vraag 3 2 TEXT	Vraag 3 3 TEXT	Vraag 3 4 TEXT	Vraag 3 5 TEXT	Vraag 3 6 TEXT	Vraag 4	Vraag 4 1 TEXT	Vraag 4 4 TEXT	Vraag 4 5 TEXT	Vraag 5	Vraag 5 1 TEXT	Vraag 5 2 TEXT	Vraag 5 3 TEXT	Vraag 5 4 TEXT	Vraag 5 5 TEXT	Vraag 6	Vraag 6 1 TEXT	Vraag 6 2 TEXT	Vraag 6 3 TEXT	Vraag 6 4 TEXT	Vraag 7	Vraag 8	Vraag 8 18 TEXT	Vraag 9	Vraag 9 12 TEXT	Vraag 10
Ik zou u graag vrijblijvend willen vragen of u uw postcode wilt invullen. Wilt u dit niet dan vult u niks in.	Ik val binnen de leeftijdsgroep:	De mobiliteitshub op onderstaande afbeelding bevind zich binnen 350m van uw woonlocatie. Bent u bekend met het concept "mobiliteitshub" zoals hier weergegeven? - Selected Choice	De mobiliteitshub op onderstaande afbeelding bevind zich binnen 350m van uw woonlocatie. Bent u bekend met het concept "mobiliteitshub" zoals hier weergegeven? - Anders, namelijk: - Text	Ik ben bekend met het concept "deelauto" zoals hier weergegeven	Heeft u of uw huishouden een eigen auto (privé bezit of lease) en gebruikt u deze ook? (meerijden valt ook onder het gebruik van de auto) - Selected Choice	Heeft u of uw huishouden een eigen auto (privé bezit of lease) en gebruikt u deze ook? (meerijden valt ook onder het gebruik van de auto) - Nee, omdat: - Text	Wat vindt u van de volgende stelling? "Ik vind over het algemeen dat deelvervoer (auto, fietsen, scooters) een fijne manier van reizen biedt" - Selected Choice	Wat vindt u van de volgende stelling? "Ik vind over het algemeen dat deelvervoer (auto, fietsen, scooters) een fijne manier van reizen biedt" - Totaal mee oneens, omdat: - Text	Wat vindt u van de volgende stelling? "Ik vind over het algemeen dat deelvervoer (auto, fietsen, scooters) een fijne manier van reizen biedt" - Mee oneens, omdat: - Text	Wat vindt u van de volgende stelling? "Ik vind over het algemeen dat deelvervoer (auto, fietsen, scooters) een fijne manier van reizen biedt" - Neutraal, omdat: - Text	Wat vindt u van de volgende stelling? "Ik vind over het algemeen dat deelvervoer (auto, fietsen, scooters) een fijne manier van reizen biedt" - Mee eens, omdat: - Text	Wat vindt u van de volgende stelling? "Ik vind over het algemeen dat deelvervoer (auto, fietsen, scooters) een fijne manier van reizen biedt" - Totaal mee eens, omdat: - Text	Wat vindt u van de volgende stelling? "Ik vind over het algemeen dat deelvervoer (auto, fietsen, scooters) een fijne manier van reizen biedt" - Geen mening, omdat: - Text	Wist u voordat u aan deze enquête begon dat er een mobiliteitshub bij u in de buurt zit? - Selected Choice	Wist u voordat u aan deze enquête begon dat er een mobiliteitshub bij u in de buurt zit? - Ja, omdat: - Text	Wist u voordat u aan deze enquête begon dat er een mobiliteitshub bij u in de buurt zit? - Nee, omdat: - Text	Wist u voordat u aan deze enquête begon dat er een mobiliteitshub bij u in de buurt zit? - Anders, namelijk: - Text	Heeft u wel eens gebruik gemaakt van deze hub? (meerdere antwoorden zijn mogelijk) - Selected Choice	Heeft u wel eens gebruik gemaakt van deze hub? (meerdere antwoorden zijn mogelijk) - Ja een deelauto, omdat: - Text	Heeft u wel eens gebruik gemaakt van deze hub? (meerdere antwoorden zijn mogelijk) - Ja een deelbakfiets, omdat: - Text	Heeft u wel eens gebruik gemaakt van deze hub? (meerdere antwoorden zijn mogelijk) - Ja een deelfiets, omdat: - Text	Heeft u wel eens gebruik gemaakt van deze hub? (meerdere antwoorden zijn mogelijk) - Nee ik heb deze hub nog nooit gebruikt, omdat: - Text	Heeft u wel eens gebruik gemaakt van deze hub? (meerdere antwoorden zijn mogelijk) - Anders, namelijk: - Text	Ik gebruik de deelauto's op deze hub: - Selected Choice	Ik gebruik de deelauto's op deze hub: - Een enkele keer, omdat: - Text	Ik gebruik de deelauto's op deze hub: - Weinig / Sporadisch, omdat: - Text	Ik gebruik de deelauto's op deze hub: - Regelmatig / Frequent, omdat: - Text	Ik gebruik de deelauto's op deze hub: - Bijna altijd, omdat: - Text	Waarom maakt u gebruik van de deelauto's op deze de hub? (meerdere antwoorden zijn mogelijk)	Ik maak geen gebruik van de deelauto's op deze hub omdat: (meerdere antwoorden zijn mogelijk) - Selected Choice	Ik maak geen gebruik van de deelauto's op deze hub omdat: (meerdere antwoorden zijn mogelijk) - Anders, namelijk: - Text	Zou u overwegen om de deelauto's op deze hub (vaker) te gebruiken als... (meerdere antwoorden zijn mogelijk) - Selected Choice	Zou u overwegen om de deelauto's op deze hub (vaker) te gebruiken als... (meerdere antwoorden zijn mogelijk) - Anders, namelijk: - Text	Hier kunt u nog eventuele opmerkingen kwijt, over bijvoorbeeld: (1) waarom u op dit moment de deelauto's op deze mobiliteitshub wel of niet gebruikt; (2) wat de mobiliteitshub volgens u zou kunnen bieden dat u dit in de toekomst wel / vaker zou overwegen
3562 WT	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Nee, omdat:	Niet nodig, hoef alleen kleine afstanden in de randstad af te leggen	Mee eens, omdat:				Handig voor bepaalde gelegenheid zoals weekendje weg			Ja, omdat:	Ik er gebruik van heb gemaakt			Ja een deelauto, omdat:						Weinig / Sporadisch, omdat:		Zoals ik zei, voor bijvoorbeeld voor een weekendje weg en ik zelf geen auto heb			Ik heb geen eigen auto	Geen van deze opties		Geen van deze opties		
3526wh	18-35	Ik ben bekend met het concept "mobiliteitshub" maar herken deze locatie op de foto niet als hub		Ja	Ja, een enkele auto		Neutraal, omdat:							Ja, maar ik wist niet dat dit een mobiliteitshub heet				Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik een eigen auto heb								Geen van deze opties		Geen van deze opties		Het hebben van een eigen auto geeft ook een bepaalde status gezien je er hard voor hebt gewerkt, daarom gebruik ik liever een deelauto
3562 WT	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Nee	Nee, omdat:	Geen geld voor en met ov kom ik meestwl waar ik wil	Mee eens, omdat:				Het opent bepaalde opties wanneer je zelf geen auto kan betalen			Ja, maar ik wist niet dat dit een mobiliteitshub heet				Nee ik heb deze hub nog nooit gebruikt, omdat:												Geen van deze opties		Het boeken van een deelauto wat gemakkelijker zou zijn,Er iemand op de hub iemand aanwezig zou zijn om een oogje in het zeil te houden en waar ik vragen aan kan stellen,Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is		
3562 WT	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Ja, een enkele auto		Mee eens, omdat:				Flexibel en geen onderhoudskosten			Ja, omdat:	Ik wel eens een deelauto heb gebruikt			Ja een deelauto, omdat:	Mijn eigen auto stond op dat moment bij de garage					Een enkele keer, omdat:	Ik gebruik nu geen deelauto meer want heb mijn eigen auto weer				Geen van deze opties			Ik mijn privé auto niet meer in mijn eigen straat zou mogen parkeren		
3562 WT	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Nee, omdat:	Te veel belastingkosten en alles is in de buurt	Neutraal, omdat:			Het geeft wel flexibiliteit, maar het is ook duur				Ja, maar ik wist niet dat dit een mobiliteitshub heet				Nee ik heb deze hub nog nooit gebruikt, omdat:												Geen van deze opties		De deelauto net zo netjes wordt achtergelaten als ik dat bij mijn eigen auto zou doen		
3526wb	18-35	Anders, namelijk:	Ik ken deze plek, en weet dat het een mobiliteitshub genoemd wordt. Maar heb geen idee wat dat betekent.	Ja	Nee, omdat:	Ik de bijkomende kosten als vergunning niet kan betalen	Mee oneens, omdat:		Het is extreem duur en dus niet te betalen. Daarnaast heb je vaak een creditcard nodig. Wat veel Nederlanders niet hebben					Ja, omdat:	Ik hier woon en ook buiten kom. Daarnaast heb ik een brief van de gemeente gehad.			Ja een deelauto, omdat:	Ik gebruikte dit al voor de hub. Maar niet alles kan op de fiets. Dus dan een auto					Een enkele keer, omdat:	Zware spullen verplaatsen of onhandige objecten op te halen				Ik heb geen eigen auto			Het boeken van een deelauto wat gemakkelijker zou zijn,De hub naast deelvervoer ook het gemak zou aanbieden van verschillende faciliteiten zoals een pakketpunt of kiosk,Anders, namelijk:	Een heel stuk betaalbaarder zou zijn	Betaalbaarder. Je bent nu al voor uurtje bijna 30 euro vaak kwijt terwijl je kleine afstanden aflegt. Dan kan je net zo goed een auto huren voor een dag bij de grote bedrijven
3526WT	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Nee, omdat:	Ik ben student en heb dus noch geld noch reden om een auto te hebben	Geen mening, omdat:						Ik het nog nooit heb gebruikt.	Ja, omdat:	Ik heb het bord wel eens zien staan.			Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik er geen reden voor heb gehad.								Ik geen verre afstanden hoef te reizen		Geen van deze opties		
3562 WT	18-35	Ik ben niet bekend met deze locatie maar wel met het concept "mobiliteitshub"		Nee	Ja, een enkele auto		Geen mening, omdat:						Ik ben er niet bekend mee	Nee, omdat:		Ik niet wist wat dit was		Nee ik heb deze hub nog nooit gebruikt, omdat:												Geen van deze opties		Geen van deze opties		
3562 WT	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Nee, omdat:	Ik heb een treinabbonement en milie speelt ook een rol	Mee eens, omdat:				Je hoeft daardoor geen eigen auto te hebben			Ja, maar ik wist niet dat dit een mobiliteitshub heet				Nee ik heb deze hub nog nooit gebruikt, omdat:				Het is nog niet nodig geweest								Ik vind dat de deelauto te duur is		De deelauto net zo netjes wordt achtergelaten als ik dat bij mijn eigen auto zou doen		
3562 WT	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Ja, twee auto's		Geen mening, omdat:						Ik het nog nooit heb gebruikt	Ja, maar ik wist niet dat dit een mobiliteitshub heet				Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik een eigen auto heb								Geen van deze opties		Geen van deze opties		
3562 WT	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Nee, omdat:		Totaal mee eens, omdat:					Het is gemakkelijk		Ja, omdat:	Ik kreeg hier een brief over			Ja een deelauto, omdat:	Ik heb geen eigen auto, kost geen tijd					Een enkele keer, omdat:	Soms verder moet dan op de fiets				Ik heb geen eigen auto,Omdat ik het fijn vind dat ik de keuze heb uit verschillende type auto's op deze hub			Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is		
3562 WT	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Ja, een enkele auto		Mee eens, omdat:				De ov fiets is erg fijn			Ja, omdat:	Ik heb gekeken of het gebruik van een deelauto iets voor mij zou zijn			Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik de deelauto te duur vind voor een hele dag t.o.v. de eigen auto								Ik vind dat de deelauto te duur is,Ik er niet op kan vertrouwen dat er op elk moment van de dag een deelauto beschikbaar is		Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is,De deelauto net zo netjes wordt achtergelaten als ik dat bij mijn eigen auto zou doen		
3562 WT	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Ja, een enkele auto		Neutraal, omdat:			Ik er zelf geen gebruik van maak, maar ik geloof wel dat het fijn is voor anderen				Ja, omdat:	Ik hier een brief over heb gekregen			Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik een eigen auto heb								Ik vind dat de deelauto te duur is,Het gebruik van de deelauto op de hub geen extra gemak bied,Ik er niet op kan vertrouwen dat er op elk moment van de dag een deelauto beschikbaar is,Ik veel waarde hecht aan mijn eigen ruimte en een deelauto niet netjes wordt achtergelaten		De hub naast deelvervoer ook het gemak zou aanbieden van verschillende faciliteiten zoals een pakketpunt of kiosk,Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is		Parkeerbeleid wekt vooral frustratie op en zorgt er niet voor dat mensen de deelauto meer gaan gebruiken
3562 WT	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Ja, een enkele auto		Mee oneens, omdat:		Het bied een uitkomst wanneer het noodzakelijk is, maar toen ik het veel gebruikte waren de kosten heel hoog					Ja, omdat:	Toen ik hier net kwam wonen en geen eigen auto had maakte ik er veel gebruik van			Ja een deelauto, omdat:	Ik had op dat moment geen eigen auto en moest voor werk reizen					Een enkele keer, omdat:	Alleen veel in de periode dat ik geen eigen auto had				Geen van deze opties			Het mij geen extra tijd zou kosten,Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is	Als ik niet zo makkelijk de beschikking tot een laadpaal zou hebben en die hier wel staat	Ik vond de trein vervelend, daarom pakte ik liever de deelauto
3562 WT	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Ja, een enkele auto		Neutraal, omdat:			Zelf gebruik ik het niet, maar mijn vrienden zijn er enthousiast over				Ja, omdat:				Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik een eigen auto heb								Het gebruik van de deelauto op de hub geen extra gemak bied		Ik mijn privé auto niet meer in mijn eigen straat zou mogen parkeren		Ik zie het als tussen oplossing en zou er pas gebruik van maken als de auto zelf komt voorrijden
3562 WT	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Nee, omdat:		Mee eens, omdat:				Vrienden raden het aan, in de buurt is geen parkeerplek, beter voor het milieu			Ja, omdat:				Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik op 5min fietsen een bijna altijd een auto kan lenen								Ik niet weet hoe duur het gebruik van een deelauto is t.o.v. een privé of lease auto		Er iemand op de hub iemand aanwezig zou zijn om een oogje in het zeil te houden en waar ik vragen aan kan stellen,Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is		Ik sta er positief tegenover maar gebruik het zelf niet
3526	18-35	Ik ben bekend met het concept "mobiliteitshub" maar herken deze locatie op de foto niet als hub		Ja	Nee, omdat:	Ik het te duur vind voor de paar ritten die ik maak. Naar werk ga ik met de fiets	Mee oneens, omdat:		Je alsnog niet de vrijheid hebt, die een eigen auto wel biedt. Ik leen liever een auto van een vriend. Misschien ook door te weinig kennis over hoe een deelauto te gebruiken icl kosten etc					Ja, maar ik wist niet dat dit een mobiliteitshub heet				Ja een deelfiets, omdat:			NuMijn eigen ebike werd gerepareerd. Wat een geld kost Tier. Absoluut veel te veel geld wat je kwijt bent, wanneer je bijv 5 dagen in de week naar werk moet, wat elke dag 20km is.									Ik vind dat de deelauto te duur is,Ik er niet op kan vertrouwen dat er op elk moment van de dag een deelauto beschikbaar is,Ik niet kan rekenen op de beschikbaarheid van de deelauto,Anders, namelijk:	Het wordt niet gereguleerd door bijv de overheid zonder winstoogmerk. Om de verkeersdrukte en de hoeveelheid auto's terug te dringen is een deelauto een deel van de oplossing. Echter, worden deze verhuurd door bedrijven die dit als verdienmodel hebben. Voor mij is het daarom te duur.	Geen van deze opties		Stel je hebt een dag een auto nodig voor een ritje naar je ouders/vrienden/dagje uit. Dan kost het je 35 euro, zonder dat je maar een kilometer hebt gereden. Tel de benzine/stroom erboven op en je bent meteen het dubbele kwijt. Als ik 100 kilometer moet rijden en heb de auto nodig van 9 tot 15, kies ik veel liever voor het lenen van een auto van een bekende ivm de kosten
3562 WT	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Nee, omdat:	Ik heb een fiets en het ov is stabiel genoeg	Totaal mee eens, omdat:					Er nu veel auto's stil staan en het gebruik van deelauto's duurzamer is		Ja, omdat:	Ik er wel eens langskom			Anders, namelijk:					Nog niet							Ik niet weet hoe duur het gebruik van een deelauto is t.o.v. een privé of lease auto,Ik mij comfortabel voel bij mijn routine,Het gebruik van de deelauto op de hub geen extra gemak bied		Geen van deze opties		Ik heb wel eens een deelauto gebruikt die niet op deze hub stond en dat beviel goed
3562 WT	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Ja, een enkele auto		Geen mening, omdat:						Ik heb het nog nooit gebruikt	Ja, maar ik wist niet dat dit een mobiliteitshub heet				Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik heb een eigen fiets en auto, dus het is nog niet nodig geweest								Ik er niet op kan vertrouwen dat er op elk moment van de dag een deelauto beschikbaar is		Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is		
3562 WT	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Nee, omdat:	Ik kan makkelijk een auto lenen, verder is het ov goed te doen	Mee eens, omdat:				Het is efficiënt en bied extra mogelijkheden als het ov een keer niet uitkomt			Ja, maar ik wist niet dat dit een mobiliteitshub heet				Ja een deelfiets, omdat:			De bus op dat moment niet meer reed									Ik geen verre afstanden hoef te reizen		Het boeken van een deelauto wat gemakkelijker zou zijn		
3562 WT	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Nee	Nee, omdat:		Mee eens, omdat:				Het is beter voor het milieu			Nee, omdat:		Ik niet bekend was hiermee		Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik heb er nog geen reden voor gehad								Anders, namelijk:	Rijden is vanwege medicatie op dit moment niet mogelijk	Geen van deze opties		
3562 WT	18-35	Ik ben bekend met het concept "mobiliteitshub" maar herken deze locatie op de foto niet als hub		Ja	Nee, omdat:	Nog aan het sparen	Mee eens, omdat:				Ligt wel aan de situatie en of de auto netjes wordt achter gelaten, en beter voor het milieu			Ja, maar ik wist niet dat dit een mobiliteitshub heet				Anders, namelijk:					Een deelauto op een andere locatie, beviel goed							Ik niet weet hoe duur het gebruik van een deelauto is t.o.v. een privé of lease auto,Ik geen verre afstanden hoef te reizen		Anders, namelijk:	Als het goedkoper zou zijn	Ik heb wel al eens een deelauto gebruikt en heb daarom wel overwogen om het te gebruiken, maar voor lange afstanden is het te duur
3562 WT	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Ja, een enkele auto		Totaal mee eens, omdat:					Ov fiets bied een fijne manier van reizen, en de gadachten om materieel te delen vind ik mooi en goed		Ja, omdat:				Nee ik heb deze hub nog nooit gebruikt, omdat:				Voor lange afstanden is een deelauto te duur, verdee heb ik zelf een fiets en auto, mijn vrouw heeft geen auto en het station is dichtbij								Ik niet weet hoe duur het gebruik van een deelauto is t.o.v. een privé of lease auto		Ik mijn privé auto niet meer in mijn eigen straat zou mogen parkeren		
3562 WT	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Nee, omdat:	Ik heb net pas mijn rijbewijs gehaald, en een verzekering is erg duur zonder schade vrije jaren	Mee eens, omdat:				Zolang alles netjes wordt achtergelaten en bied een uitkomst voor het doen van boodschappen of als ik naar de bouwmarkt wil			Ja, omdat:	Ik er gebruik van heb gemaakt			Ja een deelauto, omdat:	Ik geen eigen auto heb en ook omdat ik rijden leuk vind					Weinig / Sporadisch, omdat:		Ik niet vaak de noodzaak heb om een auto te pakken			Ik heb geen eigen auto			Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is		Voor sommige aanbieders heb je een jaar je rijbewijs nodig anders dekt de verzekring eventuele schade niet, dat weerhoud mij ervan om die aanbieder te proberen
3526WK	36-50	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Ja, een enkele auto		Mee eens, omdat:				Kan handig zijn als je de auto niet vaak gebruikt			Ja, omdat:				Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik zelf een auto en een fiets heb								Anders, namelijk:	Ik heb zelf een auto, en die heb ik ook nodig voor werk (bestelauto, ben meubelmaker)	De hub naast deelvervoer ook het gemak zou aanbieden van verschillende faciliteiten zoals een pakketpunt of kiosk,Er iemand op de hub iemand aanwezig zou zijn om een oogje in het zeil te houden en waar ik vragen aan kan stellen		
3526WP	18-35	Ik ben bekend met het concept "mobiliteitshub" maar herken deze locatie op de foto niet als hub		Ja	Ja, een enkele auto		Neutraal, omdat:			Nooit gebruik van gemaakt				Ja, maar ik wist niet dat dit een mobiliteitshub heet				Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik mijn eigen auto gebruik								Ik mijn eigen auto gewoon voor de deur kan parkeren en de deelauto niet		Anders, namelijk:	Als ik geen persoonlijke auto had, dan zou ik er gebruik van maken	
3526wc	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Nee, omdat:	Ik heb een eigen motor. Ik heb geen auto.	Totaal mee oneens, omdat:	Wel de flexibiliteit van een eigen voertuig maar niet al het gedoe van het eigen bezit						Ja, omdat:	Communicatie vanuit de gemeente hierover gaf mij de kennis van de term mobiliteitshub. Ik had de deelvoertuigen zelf allemaal wel al zien staan			Ja een deelauto, omdat:	Vervoeren spullen, iets ophalen via marktplaats, naar een voorstelling waar ov slecht was.					Een enkele keer, omdat:	Ik heb een fiets en daarmee kan bijna alles in de stad. Dus voor de uitzonderingen				Ik heb geen eigen auto,Ik weet dat het gebruik van een deelauto goedkoper voor mij goedkoper is dan het hebben van een privé of lease auto			Geen van deze opties		
35	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Nee, omdat:	Geen auto	Neutraal, omdat:			Nog geen ervaring mee				Ja, omdat:	Is gecommuniceerd door wooncooperatie of gemeente			Nee ik heb deze hub nog nooit gebruikt, omdat:				Weet niet hoeveel het kost en of het aanmelden ingewikkeld is. Moet dan ook uitzoeken hoe het zit qua verzekering								Anders, namelijk:	De drie redenen die ik net gaf	Het boeken van een deelauto wat gemakkelijker zou zijn,Het mij geen extra tijd zou kosten,De deelauto net zo netjes wordt achtergelaten als ik dat bij mijn eigen auto zou doen		
3526 SM	51-65	Nee		Nee	Ja, een enkele auto		Mee eens, omdat:				Het is te gek dat iedereen een eigen auto heeft			Nee, omdat:		Ik ken de locatie wel maar was niet bekend met het begrip		Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik heb een eigen auto, en mijn vrouw is minder mobiel waardoor ik die ook nodig heb								Anders, namelijk:	Het delen van een auto kan niet omdat mijn vrouw minder mobiel is	Geen van deze opties		
3526 SM	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Nee, omdat:		Totaal mee eens, omdat:					Het delen van auto's zou een mooier systeem zijn, omdat er hier ook weinig parkeerplek is		Anders, namelijk:			Ik ken wel de locatie, maar ik snap niet helemaal hoe het delen van auto's werkt	Nee ik heb deze hub nog nooit gebruikt, omdat:				Het proces om te huren is mij onbekend en had een criditcard nodig voor een grote borg								Het boeken te moeilijk is en/of te lang duurt,Er niemand aanwezig is waar ik eventuele vragen aan kan stellen,Ik niet kan rekenen op de beschikbaarheid van de deelauto		Ik mijn privé auto niet meer in mijn eigen straat zou mogen parkeren,De hub naast deelvervoer ook het gemak zou aanbieden van verschillende faciliteiten zoals een pakketpunt of kiosk,De loopafstand naar de hub kleiner zou zijn,Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is		Ik heb wel eens gekeken voor een sixt auto maar die zijn hier nooit beschilbaar, dus ik vind beschikbaarheid belangrijk
3526 SM	18-35	Ik ben bekend met het concept "mobiliteitshub" maar herken deze locatie op de foto niet als hub		Ja	Nee, omdat:		Totaal mee eens, omdat:					Van mij mogen alle parkeerplekken weg en worden vervangen door mobiliteitshubs, ik zie de deelauto als mooie toevoeging aan het ov		Anders, namelijk:			Ik ken de locatie, maar wist niet dat hier deelauto's staan	Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik heb een eigen fiets en een ov kaart								Anders, namelijk:	Ik heb het nog nooit nodig gehad en omdat ik niet weet hoe het werkt is de drempel voor mij hoog om in te stappen	Er iemand op de hub iemand aanwezig zou zijn om een oogje in het zeil te houden en waar ik vragen aan kan stellen		Ik denk dat ze meer mogen promoten hoe het boeken en gebruiken werkt, want het niet weten is nu een drempel
3526 SM	36-50	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Ja, een enkele auto		Mee eens, omdat:				Het bied soms een uitkomst, zoals een fiets om thuis te komen en en kan me voorstellen dat het voor anderen fijn is!			Ja, maar ik wist niet dat dit een mobiliteitshub heet				Ja een deelfiets, omdat:			Ik thuis moest komen									Anders, namelijk:	Ik zie gewoon geen reden om het te gebruiken	Geen van deze opties		
3526 SM	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Nee, omdat:	Niet nodig en duur	Mee eens, omdat:				Het bied een uitkomst als je even niet je eigen fiets ter beschikking hebt			Ja, maar ik wist niet dat dit een mobiliteitshub heet				Ja een deelfiets, omdat:			Ik had toen even geen eigen fiets									Anders, namelijk:	Ik weet het niet want ik heb me er nog niet in verdiept	Geen van deze opties		
3526 SM	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Nee, omdat:	Het is in de stad niet makkelijk om een auto te hebben want er is weing ruimte en weinig parkeerplekken en het is ook niet nodig voor mij	Mee eens, omdat:				Deelauto is een mooie oplossing want er is te weinig plek			Ja, maar ik wist niet dat hier ook deelauto's worden aangeboden				Nee ik heb deze hub nog nooit gebruikt, omdat:												Geen van deze opties		Het boeken van een deelauto wat gemakkelijker zou zijn		
3526 SM	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Nee, omdat:		Mee eens, omdat:				Het is beter voor het milieu en is soms handig			Anders, namelijk:			Ik wist wel dat hier deelfietsen staan	Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik zou het wel overwegen als het nodig is, maar tot nu toe is het nog nooit nodig geweest								Anders, namelijk:	Er zijn hier genoeg middelen, zoals het ov	Anders, namelijk:	De drempel om een deelauto te gebruiken zou lager zijn als er een duidelijk bord stond met uitleg hoe het werkt en de prijzen	
3526 SM	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Ja, een enkele auto		Mee eens, omdat:				Ik heb het wel eens een deelauto in Den Haag gebruikt en dat beviel goed			Ja, maar ik wist niet dat dit een mobiliteitshub heet				Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik heb een eigen auto								Ik mijn eigen auto gewoon voor de deur kan parkeren en de deelauto niet		Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is		Een deelauto of ander deelvervoer bied een mooie oplossing voor als de trein of de bus een keer niet rijd, het nadeel is wel dat je bijv de auto weer naar dezelfde plek moet terugbrengen
3526wh	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Ja, een enkele auto		Neutraal, omdat:			Handig voor als je geen auto hebt lijkt mij				Ja, omdat:	Daardoor wij minder parkeerplekken nu hebben voor de deur			Nee ik heb deze hub nog nooit gebruikt, omdat:				Niet nodig								Anders, namelijk:	Ik een eigen auto heb	Geen van deze opties		
3526SL	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Ja, twee auto's		Geen mening, omdat:						Ik heb er nog nooit gebruik van gemaakt, omdat ik het niet als nodig heb ervaren	Ja, omdat:	Ik het concept ken, en daardoor ook de plek herken			Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik een eigen fiets en beschikking tot twee auto's heb								Het gebruik van de deelauto op de hub geen extra gemak bied,Ik geen verre afstanden hoef te reizen		Geen van deze opties		
3526	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Nee, omdat:	Auto kost te veel en kan alles ook met fiets of ov	Mee eens, omdat:				Het een redelijk makkelijke oplossing kan bieden als je de auto weinig nodig hebt.			Ja, omdat:	Ik om mij heen kijk als ik buiten ben en er afgelopen jaar een brief van de gemeente was gestuurd met mededeling over de deel hun.			Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik zelf een fiets heb en niet zo goed kan inschatten hoe voordelig de auto is en het al snel buiten budget valt voor langere reizen.								Ik vind dat de deelauto te duur is,Ik niet weet hoe duur het gebruik van een deelauto is t.o.v. een privé of lease auto,Ik mij comfortabel voel bij mijn routine,Het boeken te moeilijk is en/of te lang duurt,Ik geen verre afstanden hoef te reizen		Het boeken van een deelauto wat gemakkelijker zou zijn,De hub naast deelvervoer ook het gemak zou aanbieden van verschillende faciliteiten zoals een pakketpunt of kiosk		Het is niet overzichtelijk welke deel auto vervoerder waar staat en hoe veel dat kost en welke procedure je moet doorlopen om de auto te mogen huren. Ik zou eeen snelle informatie voorziening moeten krijgen om het te overwegen
3526 SM	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Nee	Nee, omdat:	Ik kan makkelijk en altijd een auto lenen	Geen mening, omdat:						Ik ben er niet bekend mee	Nee, omdat:				Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik weet niet hoe het gebruik van een deelauto werkt								Anders, namelijk:	Ik kan een auto lenen	Anders, namelijk:	Als de informatie voorziening beter zou zijn, ik krijg nu nergens makkelijk en snel info over hoe het werkt	Wel eens een GO scooter gebruikt maar verder niet, dat was opzich prima
3526 SM	36-50	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Nee, omdat:	Ik heb hem net verkocht, omdat die meer stil stond dan dat ik hem gebruikte	Mee eens, omdat:				Het is mooi dat op deze manier iedereen toegang heeft tot een auto			Ja, maar ik wist niet dat dit een mobiliteitshub heet				Anders, namelijk:					Ik heb het niet nodig, als ik ergens heen wil kan de buurvrouw mij rijden of kan ik hier een auto lenen van een vriend							Anders, namelijk:	Ik heb het niet nodig	Geen van deze opties		
3526 SM	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Nee, omdat:		Mee oneens, omdat:		Ik vind het fijner als iemand een eigen auto heeft, want voor langere tijd gebruiken is geloof ik					Nee, omdat:				Anders, namelijk:					Nog nooit gebruikt, maar een deelfiets zou eigenlijk wel handig zijn, hiervoor nog niet overnagedacht dus dat ga ik wel overwegen							Ik vind dat de deelauto te duur is,Ik mij comfortabel voel bij mijn routine,Ik er niet op kan vertrouwen dat er op elk moment van de dag een deelauto beschikbaar is		Ik de keuze zou hebben uit een ander type auto (bijvoorbeeld een groter model voor een rit naar de bouwmarkt),Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is		
3526 SM	36-50	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Ja, een enkele auto		Mee eens, omdat:				Het is goed dat het er is en snap dat het fijn is voor anderen			Nee, omdat:				Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik ben er niet bekend mee, en als ik even geen eigen auto zou hebben los ik dat binnen mijn eigen kring op								Ik mijn eigen auto gewoon voor de deur kan parkeren en de deelauto niet,Het gebruik van de deelauto op de hub geen extra gemak bied,Ik veel waarde hecht aan mijn eigen ruimte en een deelauto niet netjes wordt achtergelaten		Geen van deze opties		Ik heb een eigen auto dus het is voor mij niet nodig om deze hub te gebruiken
3526 SM	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Ja, een enkele auto		Mee eens, omdat:				Het is mooi dat het voor mensen zonder auto of fiets een optie bied en qua deelauto weet je altijd zeker dat je een parkeerplek hebt. Wel zou er meer zekerheid moeten zijn dat er iets beschikbaar is			Nee, omdat:		Ik heb er nog nooit gebruik van gemaakt		Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik heb een eigen auto								Ik niet weet hoe duur het gebruik van een deelauto is t.o.v. een privé of lease auto,Ik er niet op kan vertrouwen dat er op elk moment van de dag een deelauto beschikbaar is,Ik geen verre afstanden hoef te reizen		Het mij geen extra tijd zou kosten,Ik de keuze zou hebben uit een ander type auto (bijvoorbeeld een groter model voor een rit naar de bouwmarkt),Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is		
3526 SM	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Nee, omdat:	Ik kan makkelijk een auto lenen	Geen mening, omdat:						Ik ben er niet bekend mee	Nee, omdat:				Nee ik heb deze hub nog nooit gebruikt, omdat:				Het is nog niet nodig geweest								Ik mij comfortabel voel bij mijn routine,Ik geen verre afstanden hoef te reizen		Het boeken van een deelauto wat gemakkelijker zou zijn,Anders, namelijk:	Als ik de leenauto niet meer in de eigenstraat zou kunnen parkeren	
3526 SM	18-35	Ik ben bekend met het concept "mobiliteitshub" maar herken deze locatie op de foto niet als hub		Ja	Nee, omdat:	Het ov is hier goed	Mee eens, omdat:				Het is beter voor het milieu en bied toegang als je een keer iets nodig hebt			Ja, maar ik wist niet dat dit een mobiliteitshub heet				Nee ik heb deze hub nog nooit gebruikt, omdat:												Geen van deze opties		Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is		
3526 SM	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Ja, een enkele auto		Neutraal, omdat:			Ik weet het eerlijk gezegd niet. Een systeem waar de auto zelf voor de deur komt rijden zou ik wel gebruiken. Het is wel zuiniger dan iedereen een eigen auto				Nee, omdat:		Ik er geen gebruik van heb hoeven maken		Nee ik heb deze hub nog nooit gebruikt, omdat:,Anders, namelijk:				Ik vind het een drempel om eerst uit te zoeken hoe het gebruik van een deelauto werkt, heb het idee dat dit moeilijk is maar heb mij er nog niet in verdiept	Ik zou het wel overwegen als mijn eigen auto een keer niet beschikbaar is							Ik mij comfortabel voel bij mijn routine,Ik er niet op kan vertrouwen dat er op elk moment van de dag een deelauto beschikbaar is,Anders, namelijk:	Als ik mijn auto minder vaak voor werk nodig zou hebben misschien	Het mij geen extra tijd zou kosten		Het idee is wel goed, maar ik heb nu gewoon mijn eigen auto
3526 sw	18-35	Nee		Ja	Nee, omdat:	Ik ben een student	Totaal mee eens, omdat:							Nee, omdat:				Nee ik heb deze hub nog nooit gebruikt, omdat:												Anders, namelijk:	Ik wist niet dat het er was	Geen van deze opties		
3526 SV	36-50	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Nee, omdat:	Ik rij bewust geen auto	Neutraal, omdat:			Ik gebruik het niet en voor mij heeft het geen meerwaarde, maar ik vindt het een nuttige toevoeging voor mensen die sporadisch een auto of ander vervoersmiddel nodig hebben				Ja, omdat:	Ik ben een civiel technisch ingenieur en GIS-FME regisseur, ik kom dit tegen in mijn werk			Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik geen auto nodig heb en zelf een fiets heb. Met mijn business ov kan ik al ook een fiets nemen indien nodig								Geen van deze opties		Geen van deze opties		Het vermindert mogelijk parkeerdruk
3526 SM	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Ja, een enkele auto		Mee eens, omdat:				Als ik met de trein ga is de ov fiets echt een uitkomst			Nee, omdat:				Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik heb een eigen auto								Ik mijn eigen auto gewoon voor de deur kan parkeren en de deelauto niet,Het gebruik van de deelauto op de hub geen extra gemak bied,Anders, namelijk:	Eigen auto	Ik de keuze zou hebben uit een ander type auto (bijvoorbeeld een groter model voor een rit naar de bouwmarkt)		
3526 WK	18-35	Ik ben bekend met deze locatie maar ik wist niet dat dit een mobiliteitshub is		Ja	Nee, omdat:	Niet nodig & geen parkeerplek	Mee eens, omdat:				Betaalbaar en gemakkelijk			Ja, maar ik wist niet dat dit een mobiliteitshub heet				Ja een deelauto, omdat:						Regelmatig / Frequent, omdat:					Ik heb geen eigen auto,Het is makkelijker omdat je in mijn straat geen plek hebt om te parkeren,Ik weet dat het gebruik van een deelauto goedkoper voor mij is dan het hebben van een privé of lease auto			Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is	Lagere kosten	
3526 WN	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Ja, een enkele auto		Mee eens, omdat:				Het een fijne uitkomst kan zijn wanneer ik mijn eigen vervoer niet kan gebruiken			Ja, omdat:	Het zichtbaar is als je er langs loopt/fietst of als ik mijn auto ernaast parkeer			Ja een deelfiets, omdat:			Mijn eigen biciclette kapot was of een vriend/vriending geen biciclette had									Ik niet weet hoe duur het gebruik van een deelauto is t.o.v. een privé of lease auto,Ik mij comfortabel voel bij mijn routine,Ik er niet op kan vertrouwen dat er op elk moment van de dag een deelauto beschikbaar is,Anders, namelijk:	Ik ook spullen in mijn auto wil laten liggen	Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is		
3526SX	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Ja, twee auto's		Mee eens, omdat:				Als je zelf niet tot de beschikking van vervoer bent, dit een prettige manier is om een voertuig te hebben			Ja, maar ik wist niet dat dit een mobiliteitshub heet				Nee ik heb deze hub nog nooit gebruikt, omdat:				Ik tot nu toe over een auto heb beschikt								Ik mijn eigen auto gewoon voor de deur kan parkeren en de deelauto niet,Anders, namelijk:	Ik op dit moment een eigen auto tot mijn beschikking heb, waarom een deelauto nu voor mij niet hoeft.	Het boeken van een deelauto wat gemakkelijker zou zijn,Ik mijn privé auto niet meer in mijn eigen straat zou mogen parkeren,Er iemand op de hub iemand aanwezig zou zijn om een oogje in het zeil te houden en waar ik vragen aan kan stellen,Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is		
3526WP	18-35	Ik ben bekend met het concept "mobiliteitshub" en herken deze plek ook als hub		Ja	Ja, een enkele auto		Totaal mee eens, omdat:					Voordat ik een auto kon leasen kon ik hiermee toch vaak makkelijk gebruik maken van een auto		Ja, maar ik wist niet dat dit een mobiliteitshub heet				Ja een deelauto, omdat:	Ik eerst nog geen auto kon aanschaffen (budget)					Weinig / Sporadisch, omdat:		Ik nu zelf een auto heb sinds 7 maanden			Geen van deze opties			Ik zeker zou weten dat er altijd op elk moment van de dag een deelauto beschikbaar is		

APPENDIX H: TCA (LITERATURE STUDY & EXPERTS)

In this Appendix the result of the thematic content analysis of the extensive literature study as well as the TCA of the transcriptions of the interviews with experts can be found. This Appendix is provided separately in an Excel sheet.

	Literature study				Interview with experts		
	# of times the theme is mentioned	*%*	*Keywords mentioned*	*Articles that mention the theme*	*# of times the theme is mentioned*	*Keywords mentioned*	*Organisation that mentions the theme*
Attitudes of potential users							
Convenience	16	32%	Convenience, Parking convenience	González et al. (2020); Hensher et al. (2021); Durand et al. (2018); Liao et al. (2018); Lopez-Carreiro et al. (2021); Jain et al. (2021); Matowicki et al. (2022); Lopez-Carreiro, Monzon, and Lambas (2021); Arendsen (2019); Van Veldhoven et al. (2022); Ramos and Bergstad (2021); Ikezoe et al. (2021); Cantelmo et al. (2022); Von Behren et al. (2021); Paundra et al. (2017); Van Rooij (2018)	6	Convenience, Parking convenience	Ministry of I&W(a); Municipality of Utrecht; Shared car provider; Ministry of I&W(b); Ministry of I&W(c); Glimble
Environmental concerns	14	28%	-	González et al. (2020); Durand et al. (2018); Liao et al. (2018); Lee et al. (2019); Krueger et al. (2016); Ton et al. (2019); Jain et al. (2020); Bösehans et al. (2021); Lopez-Carreiro et al. (2021); Jain et al. (2021); Van Veldhoven et al. (2022); Hong et al. (2021); Ramos and Bergstad (2021); Van Rooij (2018)	1	-	Ministry of I&W(a)
Flexibility	9	18%	Flexibility, Choice freedom, Fleet diversity	González et al. (2020); Liao et al. (2018); Polydoropoulou et al. (2020); Farahmand et al. (2021); Matowicki et al. (2022); L. Li and Zhang (2021); Van Veldhoven et al. (2022); Cantelmo et al. (2022); Selzer and Lanzendorf (2022)	0	-	-
Comfort	4	8%	Comfort, Pshycological comfort	González et al. (2020); Durand et al. (2018); Paijmans and Pojani (2021); Matowicki et al. (2022)	0	-	-
Financial aspects	19	38%	Costs, Fixed costs, Cost sensitivity	González et al. (2020); Durand et al. (2018); Circella (2018); Liao et al. (2018); Gao et al. (2020); Zijlstra et al. (2020); Jain et al. (2020); Jain et al. (2021); Wang et al. (2022); Aguilera and Cacciari (2020); L. Li and Zhang (2021); Mavlutova et al. (2021); Hong et al. (2021); Ikezoe et al. (2021); Cantelmo et al. (2022); Selzer and Lanzendorf (2022); Urbanek (2021); Paundra et al. (2017); Van Rooij (2018)	4	-	Ministry of I&W(a); Ministry of I&W(b); Ministry of I&W(c); Glimble
Functional requirements							
Accessibility	11	22%	Walking distance	Durand et al. (2018); Gao et al. (2020); Jain et al. (2021); Wang et al. (2022); Matowicki et al. (2022); Mouratidis (2022); Mavlutova et al. (2021); Aguilera-García et al. (2022); Zhou et al. (2020); Claasen (2020); Van Rooij (2018)	5	-	Ministry of I&W(a); Municipality of Utrecht; Shared car provider; Ministry of I&W(b); Glimble
Safety	10	20%	Security, Social safety	Durand et al. (2018); Liao et al. (2018); Zijlstra et al. (2020); Ton et al. (2019); Kim et al. (2021); Lopez-Carreiro et al. (2021); Hong et al. (2021); Cantelmo et al. (2022); Urbanek (2021); Van Rooij (2018)	1	Social Safety	Ministry of I&W(a)
Reliability	10	20%	Reliability, Availabililty, In case of emergency	Hensher et al. (2021); Durand et al. (2018); Liao et al. (2018); Gao et al. (2020); Farahmand et al. (2021); Van Veldhoven et al. (2022); Hong et al. (2021); Ramos and Bergstad (2021); Cantelmo et al. (2022); (Van Rooij, 2018)	3	Availability	Ministry of I&W(a); Shared car provider; Glimble
State of the vehicle	2	4%	-	Paijmans and Pojani (2021; Hong et al. (2021)	0	-	-
Visibility	1	2%	Visibility of the hub, Visibility of the shared car, Location	Van Rooij (2018)	5	Visibility of the shared car, Visibility of the hub, Digital visibility	Municipality of Utrecht; Shared car provider; Ministry of I&W(b); Glimble
State of the hub	1	2%	-	Van Rooij (2018)	-	-	-
Location of the shared car (station based / free-floating)	1	2%	Station based, Free floating	Kolleck (2021	1	-	Shared car provider
Vehicle to grid (V2G)	1	2%	-	Gschwendtner and Krauss (2022)	0	-	-
Service coverage	1	2%	-	Cantelmo et al. (2022)	0	-	-

The hubs function in the transportation system	1	2%	The function of the hub	Van Rooij (2018)	5	The need to use, Flanking policies, The function of the hub	Ministry of I&W(a); Shared car provider; Ministry of I&W(b); Glimble
Personal requirements							
Personal space	6	12%	-	Liao et al. (2018); Farahmand et al. (2021); Paijmans and Pojani (2021); Matowicki et al. (2022);Aguilera-García et al. (2022); Von Behren et al. (2021)	1	-	Glimble
Compatibility with personal lifestyle	2	4%	-	Polydoropoulou et al. (2020); Aguilera and Cacciari (2020)	3	-	Ministry of I&W(a); Municipality of Utrecht'Shared car provider
Previous experience	2	4%	Previous experience, Familiarity	Liao et al. (2018); Horjus et al. (2022)	1	Familiarity, The first step	Ministry of I&W(b)
Saving time	1	2%	-	Liao et al. (2018)	0	-	-
Control	1	2%	-	Ramos and Bergstad (2021)	0	-	-
Vehicle settings	1	2%	-	Cantelmo et al. (2022)	0	-	-
Psychological influences							
Behavioural inertia	10	20%	Routine	Alyavina et al. (2020); Jain et al. (2020); Paijmans and Pojani (2021); Matowicki et al. (2022); L. Li and Zhang (2021); Horjus et al. (2022); Ramos and Bergstad (2021); Schaefer et al. (2022); Christensen et al. (2022)	1	-	Ministry of I&W(a)
Emotions	3	6%	-	Aguilera-García et al. (2022); Ikezoe et al. (2021); Von Behren et al. (2021)	0	-	-
Status	2	4%	-	L. Li and Zhang (2021); Van Veldhoven et al. (2022)	1	-	Glimble
Social pressure	2	4%	-	Durand et al. (2018); Jain et al. (2021)	0	-	-
Aspects of the journey							
Occasional needs	7	14%	-	González et al. (2020); Liao et al. (2018); Gao et al. (2020); Jain et al. (2021); Jie et al. (2021); Christensen et al. (2022); Van Rooij (2018)	2	-	Shared car provider; Glimble
Travel distance	4	8%	-	Jain et al. (2021); Farahmand et al. (2021); Paijmans and Pojani (2021); Zhou et al. (2020)	1	-	Ministry of I&W(b)
The process of using a car	4	8%	The proces of using a shared car, planning, insurance / liability	Jain et al. (2021); Lopez-Carreiro, Monzon, and Lambas (2021); Hong et al. (2021); Cantelmo et al. (2022)	0	-	-
Travel time	1	2%	-	González et al. (2020)	0	-	-
Characteristics of private car owners							
Having a family with children	12	24%	-	González et al. (2020); Durand et al. (2018); Liao and De Almeida Correia (2020); Ton et al. (2019); Jain et al. (2020); Jain et al. (2021); Jie et al. (2021); Paijmans and Pojani (2021); L. Li and Zhang (2021); Ikezoe et al. (2021); Selzer and Lanzendorf (2022); Zhou et al. (2020)	1	-	Ministry of I&W(a)
Age	10	20%	-	Liao et al. (2018); Kim et al. (2021); Jie et al. (2021); Loubser et al. (2021); Aguilera and Cacciari (2020); Farahmand et al. (2021); Hong et al. (2021); Horjus et al. (2022); Ikezoe et al. (2021); Van Rooij (2018)	0	-	Shared car provider
Low technological affinity	8	16%	-	Durand et al. (2018); Liao et al. (2018); Brezovec and Hampl (2021); Bösehans et al. (2021); Jain et al. (2021); Loubser et al. (2021); Aguilera and Cacciari (2020); Horjus et al. (2022)	0	-	-
(Non-) multimodal mindset	7	14%	-	González et al. (2020); Durand et al. (2018); Gao et al. (2020); Wang et al. (2022); Aguilera and Cacciari (2020); Horjus et al. (2022); Van 't Veer et al. (2023)	0	-	-
Perceived mobility needs	7	14%	-	Durand et al. (2018); Kim et al. (2021; Jain et al. (2021); Paijmans and Pojani (2021); L. Li and Zhang (2021); Ramos and Bergstad (2021); Zhou et al. (2020)	0	-	-
Personal believes	7	14%	-	Lopez-Carreiro et al. (2021); Jain et al. (2021); Smith et al. (2022); Jie et al. (2021); L. Li and Zhang (2021); Ramos and Bergstad (2021); Redman et al. (2013)	0	-	-

Gender	5	10%	-	Bösehans et al. (2021); Kim et al. (2021); Van Veldhoven et al. (2022); Hong et al. (2021); Ikezoe et al. (2021)	0	-	-
Educational level	5	10%	-	Aguilera and Cacciari (2020); Farahmand et al. (2021); Hong et al. (2021); Horjus et al. (2022); Zhou et al. (2020)	0	-	-
Vehicle preference	4	8%	-	González et al. (2020); Durand et al. (2018); Alyavina et al. (2020); Claasen (2020)	0	-	-
Possession of normative believes	4	8%	-	Paijmans and Pojani (2021); L. Li and Zhang (2021); Aguilera-García et al. (2022); Hong et al. (2021)	0	-	-
Feeling the need to adhere to subjective norms	4	8%	-	Jain et al. (2021); Aguilera and Cacciari (2020); Ramos and Bergstad (2021); Selzer and Lanzendorf (2022)	0	-	-
Unawareness	3	6%	-	González et al. (2020); Jain et al. (2020); Schaefer et al. (2022)	3	-	Ministry of I&W(a); Ministry of I&W(b); Glimble
Physical issues	1	2%	-	Durand et al. (2018)	0	-	-
Car demanding occupation	1	2%	-	Durand et al. (2018)	0	-	-
Aspects of a mobility hub							
Type of shared cars offered	9	18%	, Model, Diversity of vehicles	Hensher et al. (2021); Krueger et al. (2016); Paijmans and Pojani (2021); Mavlutova et al. (2021); Ikezoe et al. (2021); Cantelmo et al. (2022); Paundra et al. (2017); Zhou et al. (2020); Van Rooij (2018)	5	Quality, Model, Rental, Shared	Ministry of I&W(a); Municipality of Utrecht; Shared car provider; Ministry of I&W(c); Glimble
Parking convenience	2	4%	Parking convenience	Alyavina et al. (2020); Matowicki et al. (2022)	0	-	
A nice place to reside	1	2%	Travel socialisation	Jain et al. (2021)	1	-	Glimble
Diversity in offered vehicles	1	2%	-	Van Rooij (2018)	4	-	Municipality of Utrecht; Shared car provider; Ministry of I&W(b); Ministry of I&W(c)
The role of additional facilities	0	0%	-	-	5	-	Ministry of I&W(a); Municipality of Utrecht; Shared car provider; Ministry of I&W(b); Ministry of I&W(c)
Manned servicepoint	0	0%	-	-	0	-	-
Presence of additions for shared cars	0	0%	-	-	1	-	Ministry of I&W(b)

APPENDIX I: TCA (INTERVIEW WITH RESIDENTS)

In this appendix the result of the thematic content analysis of the answers provided in the interview with residents can be found.

THEMES MENTIONED IN THE DECISION NOT TO USE A SHARED CAR AT THE MOBILITY HUB

Main-theme	Subtheme	%
Aspects of the journey	The process of using a car	13%
	Travel distance	11%
Attitudes	Convenience	19%
Challenging characteristics of potential users	Personal believes	2%
	Unawareness	13%
Financial aspects	Financial aspects	21%
Functional requirements	The hub's function in the transportation system	20%
	Availability	15%
Personal requirements	Personal space	6%
Psychological influence	Behavioural inertia	9%
Other	I have my own car that I use	33%
	None of the options	7%
Financial aspects	Expensive for long distances	6%
	Expensive for short distances	2%
	Insurance coverage	2%
	Too expensive in general	9%

THEMES MENTIONED WITH REGARD TO WHY RESIDENTS WOULD CONSIDER USING A SHARED CAR (MORE OFTEN) AT THE MOBILITY HUB

Main-theme	Subtheme	%
Aspects of the journey	Occasional needs	2%
	The process of using a car	15%
Attitudes	Convenience	11%
Challenging characteristics of potential users	Car demanding occupation	2%
	Unawareness	4%
Functional requirements	Accessibility	2%
	Availability	33%
Other	I wouldn't have my own car	4%
	None of the options	30%
Personal requirements	Personal space	7%
	Saving time	6%
Aspects of a mobility hub	Manned service point	9%
	The role of additional facilities	4%
	Type of shared car offered	6%
Financial aspects	Cheaper	6%